

FINAL

COMPREHENSIVE SOLID WASTE

MANAGEMENT PLAN

CITY OF ATLANTA



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CITY OF ATLANTA, GEORGIA

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AS APPROVED BY GEORGIA DEPARTMENT OF COMMUNITY AFFAIRS, JUNE 15, 1995

INTRODUCTION

This Solid Waste Plan is intended to fulfill the City of Atlanta's responsibilities under both the solid Waste Management Act and the Georgia Planning Act on solid waste issues. The Plan is based on two major goals.

Goal: "...to reduce on a state-wide per capita basis the amount of municipal solid waste being received at disposal facilities during fiscal year 1992 (July 1991 through June, 1992) by 25 percent by July 1996!!"

Goal: To "...provide to the assurance of adequate solid waste handling capability and capacity within the planning area for at least ten years from the date of completion of the plan..."

The Georgia Solid Waste Management Act requires the city to submit information to the local planning authorities on seven planning elements. These elements are:

1. **AMOUNT OF WASTE** - How much and what kind of solid waste is generated now and is projected to be generated for the ten year planning period?
2. **COLLECTION** - What is the service area and number of customers? What methods are used for collection and what organizations provide that service? What changes, additions and expansions to the collection system are planned during the planning period?
3. **WASTE REDUCTION** - What is the status of waste reduction programs such as reduction of disposal, reuse, recycling, composting and processing?
4. **DISPOSAL** - What disposal methods are presently used and what is the capacity of permitted disposal facilities? What are the plans to ensure sufficient disposal capacity for the ten year planning period?
5. **LAND LIMITATION** - What land in the planning area is suitable and available for use as solid waste handling facilities?
6. **EDUCATION AND PUBLIC INVOLVEMENT** - What are the existing and potential solid waste public involvement and educational programs?
7. **IMPLEMENTATION AND FINANCE** - What are the costs and financing options available to fund the proper disposal of solid waste?

The plan is designed, according to requirements of the Solid Waste Management Act, to serve the city's needs for the next ten years. However, it should be recognized that both the technology and management methods used in the field of solid waste management are changing rapidly. It is anticipated by the state, and has been considered by the city, that the plan will be continually modified over time.

Major changes in this plan, and in the selection of programs used, will be in accordance with prescribed laws and regulations.

COMPREHENSIVE SOLID WASTE MANAGEMENT PLAN

SUMMARY OF INFORMATION

ELEMENT ONE - AMOUNT OF WASTE

The goal of this planning element is:

"To determine the amount and composition of the solid waste generated within each community or multi-jurisdictional area in order to have a sound information base upon which to base solid waste management decisions and to determine if statewide and local goals have been met."

SOURCES OF WASTE

Residential and Commercial

Residential discards are collected from two primary sources: single family and multi-family residences. Approximately 86,000 single family and 92,000 multi-family units are serviced by the City weekly.

Almost 23 percent of the residential waste stream is yard trimmings. Twenty-eight percent is composed of the different categories of paper. The plan recognizes the fact that yard trimmings comprise 23 percent of the residential waste stream and the City will pursue removal of this component as the primary method of reaching the 25 percent reduction goal, as required by state law.

There are approximately 20,000 commercial establishments within the City limits of Atlanta. The commercial, non-residential waste stream, which also includes construction/demolition waste, is collected and disposed of by private hauling companies. The quantity of waste generated by industrial processes in Atlanta is relatively small and is handled entirely by private haulers and disposal facilities.

QUANTITY OF WASTE

The *residential* waste generation rate for Atlanta, using city landfill records and the 1990 population figure, was 4.48 PCD (Pounds per Capita per Day) for 1990. In fiscal year 1992, the waste generation rate for residential waste had dropped to 3.80 PCD, and by fiscal year 1994 the rate had dropped to 3.63 PCD. The table below provides a breakdown of the waste collected and the reduction over since the base year:

Residential (RES) and Commercial (COM) Waste Tonnage

YEAR	RES	% REDUCTION	SLUDGE	COM	COM &SLUDGE	% REDUCTION	TOTAL	% REDUCTION
FY '90	339,380	NA	34,661	NA	34,661	NA	374,041	
FY '91	293,463	NA	29,234	NA	29,234	NA	322,697	
FY '92	287,933	BASE YR	18,299	433,930	452,229	BASE YR	740,162	BASE YR
FY '93	282,673	1.83%	25,556	391,565	417,121	7.76%	699,794	5.45%
FY '94	274,946	4.51%	17,228	433,776	451,004	0.27%	725,950	1.92%
TOTAL	1,478,395		124,978	1,259,271	1,384,249		2,862,644	

Over the ten year planning period the city will require disposal assurance for approximately 5,841,212 tons of solid waste. This includes both residential and commercial.

ELEMENT TWO - COLLECTION

The goal of this planning element is:

"To ensure effective collection for the subsequent ten year plan period of solid waste, and recyclable and composting materials within each community of region."

SERVICE AREA

The City of Atlanta has an area of 131.6 square miles. The 1990 census population for the City was 415,200. The Bureau of Sanitary Services billings in 1993 indicated approximately 86,000 single family and 92,000 multi family units received collection services.

PRIVATE AND PUBLIC COLLECTION SYSTEM

The City of Atlanta, through its Bureau of Sanitary Services, collects all of the single family residential waste generated in the City. The table below describes the residential programs planned for the City over the planning period.

Table 2-1 Residential Collection Programs

WASTE COLLECTION PROGRAM	ESTIMATED IMPLEMENTATION DATE	ANNUAL TOTAL COST
Residential waste collection	Operational	\$19,150,000
Residential Curb-side Recycling Program	Operational	\$2,500,000
Yard Trimmings collection and processing	Design and Implement System starting 1995	\$2,970,890*
Volume based collection system	1996	\$5,500,000*

*** FIRST YEAR OF IMPLEMENTATION, CAPITAL AND OPERATIONS COSTS**

Haulers will be required to report annually, the amount of waste collected within the City limits.

COLLECTION VEHICLES

The City operates 51 rear loading compactor trucks for single family waste collection. These vehicles are most convenient for servicing residential customers. Additionally, 21 front loaders are used to service containers for multi-family and institutional waste collection. The present fleet of solid waste collection equipment is sufficient to serve the present and future needs of the population.

ELEMENT THREE - WASTE REDUCTION

The goal of this planning element is:

"To ensure, at a minimum, a 25 percent per capita reduction by 1996 of the amount of solid waste being received at disposal facilities by promotion of source reduction, reuse, composting, recycling and other waste reduction programs today and in the future, thereby maintaining and enhancing the quality of life of the citizens of the area."

SOURCE REDUCTION

The City of Atlanta, has established a Solid Waste Information Program. This program is operated as a continuation of the existing informational programs run by the Bureau of Sanitary Services in connection with the City's curbside recycling program. It is anticipated that the Waste Reduction Informational

Program will continually evolve to provide information on the latest improvements and newest methods in solid waste management.

REUSE

Reuse is a waste reduction method which utilizes items in the waste stream which normally would be discarded and disposed in the landfill. The City will make considerable progress toward the reduction in waste disposal by thermal treatment of the sludge generated by its sewage treatment plants, then putting the treated sludge to beneficial use as a component of masonry or other similar products. The City will also study alternative sludge reuse or disposal methods.

RECYCLING

Curbside Program (1 - 4 units)

The City provides curbside recycling service to approximately 87,000 households zoned R-1. The City expects that the amount of waste removed due to better promotion, information distribution, effects of educational programs, and an expansion in the categories of recyclables collected (drop-off centers for magazines and corrugated), will result in a waste reduction of about 2.9 percent of base year disposal (7.61 percent of residential waste). The City's curbside program will initially serve only the single family residences that generate about 51.5 percent of the waste (and recyclables).

This plan does not presently include a program to provide recycling services to residents of multi-family housing units (greater than four units). The City will develop plans and strategies to provide recycling services to its citizens living in multi-family housing units. These programs are planned for implementation in 1987.

Commercial Waste Reduction/Recycling Programs

Extensive commercial recycling is already underway in Atlanta. Element Six provides information on efforts of the private sector in waste reduction and recycling. The City will establish procedures to measure quantities of commercial waste generated within its boundaries.

A series of programs may be implemented by the City depending upon the need for such programs and the result of a cost/benefit analysis of the programs. The value of any such program may only be evaluated after appropriate information is gathered about the source and characteristics of the commercial waste stream.

It is anticipated that any of these programs would be carefully considered and examined for their impact upon the cost to businesses and effectiveness of waste reduction. The City will seek the counsel of the Atlanta Chamber of Commerce and others in the business community to develop plans for information gathering about commercial waste collection.

The following is a list of city programs in order of increasing governmental involvement in the commercial waste reduction programs. Time of implementation of any of the programs is a decision reserved by the City.

1. Require reporting of waste collected by all private haulers doing business within the city.
(Included as a part of this plan)
2. The City will develop strategies for multi-family recycling. One strategy to be considered will be to require commercial multi-family complexes to make on site recycling available to their tenants.

This may be implemented with City Council approval in 1997 if the 1996 commercial reduction goals are not met. Multi-family complexes will also, as required by State regulation, be required to have separate collection of yard trimmen's.

3. Require that commercial businesses, of a size to be determined, participate in a reduction program of their choice and show evidence of participation. This will be implemented with City Council approval in 1999 if previously set reduction goals are not met.
4. Institute additional mandatory programs to be developed in coordination with affected parties if those previously instituted voluntary measures do not achieve satisfactory reductions.

Only the first item on the list, the reporting of waste, is to be implemented as a part of this plan at this time. The value of the implementation of other programs can not be evaluated until the waste stream information is available. If voluntary waste reduction programs prove ineffective in making suitable progress toward waste reduction goals, then the more invasive programs may be further defined and considered for implementation.

The following chart outlines reduction programs planned by the City:

Table 3-1 Projected Reductions in Solid Waste Disposal from FY 1992 (Base Year) to FY 1996

PROGRAM	Operational Status	FY 1992 Tonnage (Base Year)	FY 1994 Tonnage	Tonnage Reduction from FY 1992 (Base Year) to FY 1996	Percent Reduction from FY 1992 (Base Year) to FY 1996	Percent of Base Yr. Residential Waste	Percent of Base Yr. Commercial Waste
RESIDENTIAL WASTE REDUCTION PROGRAMS							
Waste Reduction Information	Ongoing			5,758	0.8%	2.0%	0.0%
Yard Trimming Composting	4th Quarter 1995			66,223	8.9%	23.0%	0.0%
Curbside Recycling (single family)	Ongoing			21,899	3.0%	7.6%	0.0%
TOTAL RESIDENTIAL		287,933	274,946	93,880	12.7%	32.6%	0.0%
COMMERCIAL WASTE REDUCTION PROGRAMS							
Waste Reduction Information	Ongoing			9,044	1.2%	0.0%	2.0%
Sewage Sludge Thermal Treatment/Recycling	Ongoing			17,228	2.3%	0.0%	3.8%
Commercial Waste Reduction Program(s)	Ongoing			65,000	8.8%	0.0%	14.4%
TOTAL COMMERCIAL		452,229	451,004	91,272	12.3%	0.0%	20.2%
TOTALS		740,162	725,950	185,152	25.0%	32.6%	20.2%

WASTE REDUCTIONS ATTAINED IN PREVIOUS YEARS				Tonnage Reduction from FY 1992 (Base Year) to FY 1996	Percent Reduction from FY 1992 (Base Year) to FY 1996	Percent of Base Yr. Residential Waste	Percent of Base Yr. Commercial Waste
Residential Reduction (FY 1992 - FY 1994)				12,987	1.7%	4.5%	0.0%
Sewage Sludge Reduction(FY 1992 - FY 1994)				1,071	0.1%	0.00%	0.2%
TOTALS				14,058	1.8%	4.5%	0.2%

ELEMENT FOUR - DISPOSAL

The goal of this planning element is:

"To ensure that solid waste treatment and disposal facilities serving local governments and multi-jurisdictional areas meet regulatory requirements and are in place when needed to support and facilitate effective solid waste handling programs today and for the subsequent ten-year periods, thereby maintaining and enhancing the quality of life of the residents within the area."

THERMAL TREATMENT TECHNOLOGIES

A key element to an integrated waste management strategy is incorporating alternative disposal methods. One such alternative is waste-to-energy. The City has evaluated the alternatives of waste disposal using waste-to-energy and refuse derived fuel facilities. The City does not intend to pursue thermal treatment of solid waste as a part of this plan, but will continue to study the issue of waste-to-energy.

LANDFILL UTILIZATION

The residential waste collected by the City is presently disposed of under contract at the Live Oak Landfill. The City plans to continue use of this facility and will seek additional private, verifiable disposal capacity to insure a minimum of 5 years' disposal assurance. During this five year period, the City will begin planning and developing alternative disposal facilities. We anticipate the alternative facilities will be available by the year 2000. These facilities should provide the City with the remaining capacity assurances as required by the minimum planning standards.

EXISTING FACILITIES -- PLANNED AND PROJECTED

No disposal facilities are operated by the City. The Gun Club Road Landfill has approximately 3-5 years capacity remaining but is not operational. There is one private MSW landfill operating within the City limits -- Chambers Bolton Road facility. The City will develop closure/post closure plans for Key Road, Cascade Road and Gun Club Road landfills. The City will seek a permit to construct a new disposal facility. The City will continue to use the Hartsfield Pathological Incinerator for incineration of animal carcasses.

The table below provides information on closure of City landfills:

Landfill Closure 1995-1998/Post-Closure Cost Estimate

LANDFILL	Acres	Closure Cost (design & const)	# Mon. Wells (est.)	Annual Monitorin g Cost	Annual Maintenanc e Cost	30 Year Total Cost
Cascade Rd.	31	\$7,000,000	8	\$40,000	\$36,500	\$9,295,000
Key Rd.	100	\$8,500,000	20	\$100,000	\$105,500	\$14,665,000
Gun Club Rd.	110	\$9,000,000	25	\$125,000	\$115,500	\$16,215,000
E. Confed.	6	\$500,000	0	0	11,500	\$645,000
TOTALS	247	\$25,000,000	53	\$265,000	\$269,000	\$41,020,000

Notes:

1. These estimates reflect material and third party costs associated with closure of the landfills. Number of monitoring wells required may vary depending on preliminary design. Required city personnel costs not included.

2. E. Confederate closure cost is estimated separately from the other facilities and presumes that negligible monitoring and maintenance cost will be required.

3. Closure of all sites will begin in 1995. The five year plan for closure expenditures is shown in table 7-1.

ELEMENT FIVE - LAND LIMITATIONS

The goal of this planning element is:

"To ensure that the proposed solid waste handling facilities are sited in areas suitable for such developments, are compatible with surrounding uses and are not considered for location in areas which have been identified by the local government or multi-jurisdictional area as having environmental or other land use limitations."

NATURAL ENVIRONMENTAL LIMITATIONS

When considering the location of all solid waste handling facilities including landfills, the following will be considered, according to state planning guidelines:

- Floodplains
- Wetlands
- Groundwater Recharge Areas
- Other Criteria Such as:
 - Water Supply Watersheds
 - Fault Zones
 - Seismic Impact Zones
 - Unstable Areas [Karst Areas]

LAND USE PLAN / ZONING RESTRICTIONS

Land Use Plan/Zoning Restrictions

Current Land Use Plan/Zoning Restrictions (December 1994)

Zoning regulations that govern the City of Atlanta are found in the Atlanta Zoning Ordinance. This document is updated from time to time, with the most recent edition being available in the Municipal Clerk's office. The zoning classification of individual properties can be obtained from the Bureau of Buildings, Zoning Enforcement Division.

The following table indicates the zoning classifications in which certain solid waste facilities can be located.

Zoning Restrictions for Private Solid Waste Management (as of December 1994)		
Facility	Districts Allowed	Districts Allowed by Special Use Permit
Construction/Demolition Disposal		R-1, R-2, R-3, R-4, R-5
Inert Waste		R-1, R-2, R-3, R-4, R-5
Sanitary Non-Hazardous		I-1, I-2
Recycling Incidental to Other Activities	In District of Main Enterprise	
Stand Alone Operations Processing, Transfer, Storage		I-1, I-2
Biomedical Thermal Treatment Facilities	Ancillary Use with Medical Facilities	I-1, I-2
Thermal Treatment	Not Addressed	Not Addressed

As the above table illustrates, thermal treatment facilities are not specifically dealt with under present zoning regulations. Biomedical waste thermal treatment units are allowed in zones for the medical care facilities they serve, provided these facilities are located on the same lot that is zoned for a medical facility. Stand alone thermal treatment facilities and any commercial biomedical waste incinerators require a special use permit and must be located in I-1 or I-2 zoning districts.

The zoning ordinance identifies specific criteria used to determine whether a request for a special use permit complies with existing zoning standards. Noise, odor, proximity to neighborhoods, visual aesthetics to the surrounding community, egress and ingress and hours of operation are examples of criteria used to determine compliance.

As previously stated, the existing zoning ordinance does not adequately address certain solid waste facility issues. Therefore, the Bureau of Planning should actively pursue updating the zoning ordinance to establish more effective guidelines to regulate these uses. Any changes to the City's zoning ordinance that occur subsequent to City Council approval of this Solid Waste Management Plan will automatically become incorporated into this document.

SECTION SIX - EDUCATION AND PUBLIC INVOLVEMENT

The goal of this planning element is:

" To identify the resources presently available to help the residents of the City of Atlanta grasp the social and environmental issues problems, concerns, and needs associated with solid waste management, particularly in terms of littering, source reduction, recycling, reuse, disposal of household hazardous waste, composting, energy recovery, and disposal, and to propose future programs as well. "

The City will implement the Education Programs as outlined in Element Six of its Solid Waste Management Plan. A waste reduction information program is a part of the education component of the plan.

SECTION SEVEN - IMPLEMENTATION AND FINANCING

The goal of this planning element is:

" To develop a balanced affordable solid waste management implementation strategy which supports the goals and meets the requirements of the Georgia Comprehensive Solid Waste Management Act. "

The plan will be adopted by the City Council, then forwarded to the Atlanta Regional Commission (ARC) and then the Department of Community Affairs (DCA) for approvals. The plan will be reviewed annually for reporting and measuring progress. The Bureau of Sanitary Services is under the General Fund for the City of Atlanta.

Implementation

A schedule for implementing each element of the plan is developed and shown on the following table. The items in the table are activities the City is presently providing or will implement in cooperation with other government agencies.

IMPLEMENTATION SCHEDULE			
Element	Year	Cost	Funding Source
Curbside Recycling (up to four units)	ONGOING	\$2,500,000	General Fund
Multi-Family Recycling	1997	\$1,180,000	General Fund
Commercial Waste Reduction	1995 - 2002	NA.	
Yard Trimming Collection and Processing	1995	\$2,970,890	General Fund
Residential/Commercial Waste Information Program	ONGOING	Included in Curbside Program	General Fund
Volume Based Collection Program	1996	\$5,500,000	General Fund
Landfill Closures	1995	\$25,000,000	General Obligation Bonds
New Disposal Facility	1996	\$3,000,000	General Fund
TOTAL		\$33,500,000	

Note: Costs are shown for year of implementation. See Table 7-1 and 7-2 for five and ten year costs estimates

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ELEMENT ONE AMOUNT OF WASTE

The goal of this planning element is:

"To determine the amount and composition of the solid waste generated within each community or multi-jurisdictional area in order to have a sound information base upon which to base solid waste management decisions and to determine if statewide and local goals have been met."

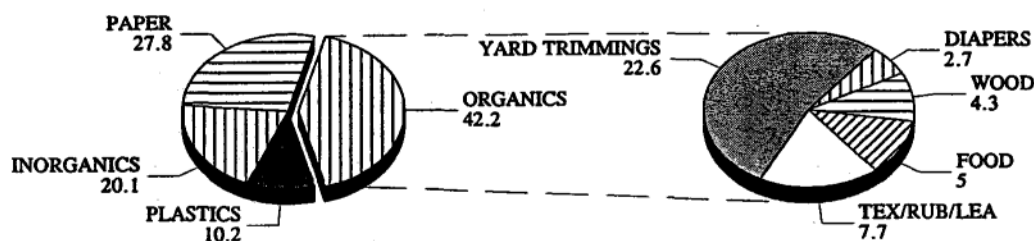
SOURCES OF WASTE

Residential

Residential solid waste is collected from two primary sources: single family and multi-family residences. Approximately 86,000 single family and 92,000 multi family units are serviced by the City weekly.

Waste stream sampling of city-collected residential waste was conducted by city personnel in each of four seasons beginning in the fall of 1991. The results and analysis are included as Appendix A to this Plan. Tables 1-1 and 1-2 summarize the results of the study and shows the proportion of each category and component as a percentage (by weight) of the total residential waste stream.

ABLE 1-1 ATLANTA'S SOLID WASTE CHARACTERIZATION
RESIDENTIAL WASTE DISCARDS



All averages are based on total residential waste stream

Almost 23 percent of the residential waste stream is yard trimmings. Twenty-eight percent is composed of the different categories of paper. This plan recognizes the fact that yard trimmings comprise approximately 23 percent of the residential waste stream and the City will pursue removal of this component as the primary method of reaching the 25 percent waste reduction goal, as required by state law.

Table 1-2 Residential Waste Stream Characteristics

Material	Fall 1991 (percent)	Winter 1992 (percent)	Spring 1992 (percent)	Summer 1992 (percent)	Weighted Average (percent)
ORGANICS					
Newspaper	5.10	7.10	6.30	7.60	6.60
Cardboard	5.10	5.10	3.80	4.90	4.70
Other Paper	13.20	23.00	16.20	13.60	16.50
Total Paper	23.40	35.20	26.30	26.10	27.80
HDPE	0.49	0.82	2.30	1.00	1.20
PET	0.42	0.84	1.00	0.80	0.80
Polystyrene Foam	0.77	0.98	1.20	1.80	1.20
Other Plastic	6.15	8.26	8.20	5.60	7.10
Total Plastic	7.83	10.90	12.70	9.20	10.30
Yard Trimmings	27.10	19.00	24.10	19.90	22.60
Wood Waste	4.00	2.90	4.40	5.70	4.30
Food Waste	3.70	5.80	4.30	6.00	5.00
Diapers	3.00	3.70	2.20	2.00	2.70
Tex/Rub/Leather	8.70	6.40	6.60	9.20	7.70
Total -Other Organics	46.50	37.80	41.60	42.80	42.30
Total Organics	77.73	83.90	80.60	78.10	80.40
INORGANICS					
Aluminum	0.83	1.01	1.10	1.50	1.10
Tin	1.83	2.27	2.60	2.00	2.20
Bimetal	0.21	1.13	0.60	0.50	0.60
Other Metals	2.04	1.05	1.60	2.90	1.90
Glass Bottles	5.48	6.62	4.40	7.30	5.90
Other Glass	0.63	0.36	0.10	0.10	0.30
Dirt/Gravel/Others	11.21	3.72	9.20	7.60	8.00
Total Inorganics	22.23	16.16	19.60	21.90	20.00
TOTALS	99.96	100.06	100.20	100.00	100.40

Note: 1. Total may not equal 100% due to rounding
 2. The total weighted average considers the weight of materials from landfill records for 1992.

Commercial

There are approximately 20,000 commercial establishments within the city limits of Atlanta. The commercial waste stream consists of waste from facilities such as county, state, and federal governmental facilities, and sports facilities, exhibit halls, convention centers, museums, theaters, shopping areas, airports, restaurants, nightclubs, hotels, colleges, universities, hospitals, corporate offices, and many other retail, wholesale and service establishments. Consequently, the commercial waste volume in Atlanta is higher on a per capita basis than most communities because of the large number of persons commuting into the city for work and recreation.

The commercial, non-residential waste stream, which also includes construction/ demolition waste, is collected by private hauling companies. The state's Private Disposal Landfill Report is used as the basis for estimating the commercial waste generation rate used in this report.

Industrial

The quantity of waste generated by industrial processes in Atlanta is relatively small and is handled entirely by private haulers and disposal facilities.

Sanitary Sewage Sludge

Sewage sludge and other similar wastes are not considered residential waste and are included in the commercial waste category for the purposes of this plan.

QUANTITY OF WASTE**Population**

The population figure from the 1990 census of 415,200 will be used for the purposes of this planning document. The Atlanta Regional Commission projects a relatively stable population for the city over the planning period.

Waste Generation Rate - Residential Waste

Table 1-3 shows the residential waste tonnage received for disposal by the city for Fiscal Years (the fiscal year (FY) referred to is the State of Georgia's fiscal year: July 1 - June 30) 1990 through 1994. The *residential* waste generation rate for Atlanta, using city landfill records and the 1990 population figure, was 4.48 PCD (Pounds per Capita per Day) for 1990. In fiscal year 1992, the waste generation rate for residential waste had dropped to 3.80 PCD, and by fiscal year 1994 the rate had dropped to 3.63 PCD.

Table 1-3 Residential (RES) and Commercial (COM) Waste Tonnage

YEAR	RES	% REDUCTION	SLUDGE	COM	COM & SLUDGE	% REDUCTION	TOTAL	% REDUCTION
FY '90	339,380	NA	34,661	NA	34,661	NA	374,041	
FY '91	293,463	NA	29,234	NA	29,234	NA	322,697	
FY '92	287,933	BASE YR	18,299	433,930	452,229	BASE YR	740,162	BASE YR
FY '93	282,673	1.83%	25,556	391,565	417,121	7.76%	699,794	5.45%
FY '94	274,946	4.51%	17,228	433,776	451,004	0.27%	725,950	1.92%
TOTAL	1,478,395		124,978	1,259,271	1,384,249		2,862,644	

Waste Generation Rate - Commercial/Construction and Demolition Waste

The quantity of commercial waste attributed to Atlanta is hard to determine because of the inter-jurisdictional routes covered by private haulers. Estimates used in this report are from the State Private Landfill reports. Using these reports, the FY 1992 commercial tonnage for Atlanta is approximated at 433,930 tons. Adding the amount of sludge disposed in Atlanta's city operated landfills for FY 1992 (18,299 tons), the total would be 452,229 tons.

PLANNED WASTE EXPORT AND IMPORT

Waste Export

One hundred percent (100%) of the City's residential solid waste will be exported to the existing Live Oaks Landfill. The commercial waste stream will also be exported to landfills outside the City with the exception of that which will be disposed of in Chamber's Bolton Road landfill.

Information about the limited availability of suitable disposal areas in the city is found in Element 5, the Land Limitation section, of this document.

Waste Import

The only disposal site importing waste into Atlanta is Chamber's Bolton Road landfill. It is estimated that this site imported **122,816** tons into Atlanta during FY 1994. This estimate is based on the first two quarterly reports submitted to EPD for fiscal year 94.

AMOUNT OF SOLID WASTE RECEIVED FOR DISPOSAL - BASE YEAR

Residential Waste Component

The residential waste received for disposal in fiscal year 1992 at city landfills was 287,933 tons (see Table 1-3). By fiscal year 1994 the residential waste disposed dropped to 274,946 tons from the amount measured in FY '1992. The Base year of 1992 will be used as a measure for the City's efforts towards a 25% reduction. Although the base year waste

component from the city's residential waste disposal as outlined and required by the State Solid Waste Management Plan is 287,933 tons, the city should be credited for its documented reduction in annual tonnage of 51,447 tons (339,380 - 287,933 the reduction in waste disposed from fiscal years 1990 to 1994).

Commercial Waste Component

The current amount of privately disposed commercial waste is taken from the private landfills reports submitted to EPD. The base year commercial waste disposed 452,229 tons is also shown in Table 1-3. The total base year tonnage is calculated by adding the residential and commercial components together for a total of 740,162 tons. All waste reduction goals and percentages will be based on this value. The current reductions of waste are summed and identified on page 27 of Element 4 in table 4-1.

Ten Year Planning Period

Table 1-4 provides an estimate of the total amount of waste to be disposed from Atlanta over the ten year planning period. The total planning requirements presumes the 25% reduction goal is reached in 1996 and, the possibility of some increase in tonnage after 1996 due to commercial growth. Accordingly, the annual tonnage will decrease to 555,122 by FY 1996 and then increase at the rate of one percent per year. This results in a total calculated amount of 5,841,212 tons of waste for which disposal must be assured.

Table 1-4 Estimated tonnage for ten year planning period

FISCAL YEAR	ANNUAL TONNAGE	PLANNING REQUIREMENTS
1995	640,536	640,536
1996	555,122	1,195,658
1997	560,673	1,756,331
1998	566,280	2,322,611
1999	571,943	2,894,554
2000	577,662	3,472,216
2001	583,439	4,055,655
2002	589,273	4,644,928
2003	595,166	5,240,094
2004	601,118	5,841,212

Assuming landfill disposal, and compaction of the waste at the landfill at a rate of 1100 lbs per cubic yard, the volume of additional landfill airspace needed (not including daily or final cover) over the remainder of the 10 year planning period will be 10,620,385 cubic yards. In round numbers, landfill waste volume of 10.6 million cubic yards is needed to disposed of *all* waste generated in Atlanta from all sources over the next ten years. Allowing an additional 25 percent for daily and final cover the air space needed will be 13.3 million cubic yards.¹ This presumes that all of Atlanta's waste, including commercial waste and construction and demolition waste components, as well as the residential waste, is to be handled by the city alone. This is neither the present condition, nor is it likely to become so. Most of the non-residential waste is now being handled by private haulers and disposal facilities. This is expected to continue in the future as well.

The City's capacity assurance requirements for the ten years planning period will be through existing private and future facilities. The residential waste collected by the City is presently disposed of under contract at the Live Oak Landfill. The City plans to continue use of this facility and will seek additional private verifiable disposal capacity to insure a minimum of 5 years' disposal assurance. During this five year period, the City will begin planning and developing alternative disposal facilities. In addition, a proposed ordinance provides yearly disposal assurances for commercial waste collected by waste haulers obtaining business licenses in the City (see Appendix C).

¹ A landfill to take 13.3 million cubic yards would need a disposal area of about 165 acres filled to an average depth of 50 feet. (13,300,000 CY/50' av. height/1613 CY/ac-ft. = 165 ac.)

ELEMENT TWO COLLECTION

The goal of this planning element is:

"To ensure the effective collection for the subsequent ten year plan period of solid waste, and recyclable and compostable materials within each community or region."

SERVICE AREA

The service area of the City of Atlanta is the incorporated city itself. The City of Atlanta has an area of 131.6 square miles. The characteristics of land usage vary from a highly urbanized central business district and other high-rise commercial areas to suburban residential areas. Atlanta is a hub for rail transportation, the intersection of major interstate highways, and has an international airport nearby.

The 1990 Census population for the City was 415,200. The Bureau of Sanitary Services billings in 1993 indicated approximately 87,000 single family and 92,000 multi-family units received collection services.

PRIVATE AND PUBLIC COLLECTION SYSTEMS

The City of Atlanta, through its Bureau of Sanitary Services, collects all of the single family residential waste generated in the City. Commercial, industrial, construction and demolition wastes are collected by approximately 16 private companies operating in the City. There are some minor exceptions to this division of the waste collection. The exceptions are relatively small and are in offsetting directions. Some waste from government commercial office buildings are collected by the city and some residential waste from some apartment areas and some residential subdivisions are collected by private haulers. For planning purposes, these exceptions should not be significant and are not factored into the analysis.

Public Collection

The Bureau of Sanitary Services handles collection of residential waste exclusively within the city limits of Atlanta. The Bureau's collection operation operates from 4 substations located throughout the City. One facility, Chester Avenue, is used primarily as a base for street sweeping in the Central Business District. The Bureau currently operates 204 waste collection routes per week throughout the City from these substations.

Atlanta's Bureau of Sanitary Services plans to continue to serve the bulk of residential waste collection needs with its own forces. Currently, there are no plans to solicit outside services for any expansion or additions for collection of waste bound for disposal. The contracting or franchising of special services such as yard trimmings collection or similar services to residential customers are currently being studied and may be accomplished. A curbside single

family residential recycling program has been contracted out to a private company and is in full operation. Details of that program are included as Appendix D.

The city does not plan to offer waste collection service to non-residential customers. Non-residential, and non-public waste collection is expected to continue to be handled by private hauling companies that now provide that service..

Private Waste Collection

Applicable sections of the Atlanta City Code will be revised and/or written to require private solid waste haulers to report the necessary data that will allow the city to satisfy the reporting obligations of the Solid Waste Act. Haulers will be required to report annually, the amount of waste collected for disposal within the city limits. In addition, on a annual basis, haulers will also be required to certify waste disposal capacity for the next year. The draft Ordinance is attached as Appendix C.

An evaluation of the services provided by private hauling and disposal companies reveals no need for the city to offer similar services or additional services to those provided by private companies. Currently, the city is satisfied that non-residential waste management needs are adequately served by private companies.

COLLECTION VEHICLES

Public/City

The city operates 51 rear loading compactor trucks for single family waste collection. These vehicles are most convenient for servicing residential customers. Additionally, 21 front loaders are used to service containers for multi-family and institutional waste collection. Multi-family residential units are serviced twice weekly. The number of vehicles stated here includes only normally operational vehicles and does not include back-up vehicles or vehicles down for maintenance. Stake bed trucks from various city departments are occasionally used to collect and transport yard trimmings from parks and other sources. Street sweeping vehicles are sometimes serviced remotely by these same collection vehicles.

The present fleet of solid waste collection equipment is sufficient to serve the present and future needs of the population. Any additions or reductions to the number of operational vehicles would be dependent upon routing changes due to changes in collection methods, regulations regarding collections, disposal locations or transfer locations. Capital costs for equipment replacements are included in the annual operations costs for the Bureau of Sanitary Services and are shown in the Five Year Work Program - (Table 7-1). Only replacement of worn equipment and minor revisions in the number of trucks is expected over the planning period.

Private

Private companies offer a wide variety of services to meet particular needs of customers from large roll off containers for large waste generators to small pick up truck sized collection vehicles that can reach awkward locations inaccessible with a standard front or rear load compactor truck.

TRANSFER POINTS

A transfer point is a facility where local waste collection vehicles transfer their waste load to larger transport vehicles that carry the waste at higher efficiency (reduced cost per ton-mile) to the disposal facility. At present no transfer points are needed by city collection vehicles. However, the ultimate location(s) of private sites outside the city will require the city or some designated agent to establish one or more waste transfer points. The existing landfill sites will be subject to use as transfer points if the need arises.

EXISTING MULTI-JURISDICTIONAL AGREEMENTS

The City does not have a multi-jurisdictional agreement with another governmental body for solid waste disposal. It may be of mutual advantage at some time in the future for Atlanta and other jurisdictions to cooperate on a temporary or longer term basis to better serve the solid waste needs of the people of this area. Such cooperation is to be encouraged where it is possible.

WASTE COLLECTION PROGRAM SUMMARY

The table below provides a summary of existing and planned collection programs for solid waste over the planning period.

Table 2-1 Residential Collection Programs

WASTE COLLECTION PROGRAM	ESTIMATED IMPLEMENTATION DATE	ANNUAL TOTAL COST
Residential waste collection	Operational	\$19,150,000
Residential Curb-side Recycling Program	Operational	\$2,500,000
Yard Trimmings collection and processing	Design and Implement System starting 1995	\$2,970,890*
Volume based collection system	1996	\$5,500,000*

*First year of implementation, capital and operations costs

ELEMENT THREE REDUCTION

The goal of this planning element is:

"To ensure, at a minimum, a 25 percent per capita reduction by 1996 of the amount of solid waste being received at disposal facilities by promotion of source reduction, reuse, composting, recycling and other waste reduction programs today and in the future, thereby maintaining and enhancing the quality of life of the citizens of the area."

This goal was set by enactment of the Solid Waste Management Act by the Georgia Legislature. In that act, the following is found in section 12-8-21 (c):

It is the intent of the General Assembly that every effort be undertaken to reduce on a state-wide per capita basis the amount of municipal solid waste being received at disposal facilities during fiscal year 1992 by 25 percent by July 1, 1996

SOURCE REDUCTION

The City of Atlanta, has established a Solid Waste Information Program. This program is operated as a continuation of the existing informational programs run by the Bureau of Sanitary Services in connection with the city's curbside recycling program.

The intent of the city is to provide information and assistance that will result in a continuing decrease in the amount of waste generated. This will be accomplished by several methods. Examples of the methods likely to be used are: encouraging back yard composting, promoting and coordinating seasonal programs such as use of mulching mowers for summer lawn mowing, Christmas tree mulching programs, and fall and spring yard trimmings reduction programs. The city's procurement policy will be evaluated and where economically feasible encourage the substitution of reusable and/or recycled goods and products that can be purchased in bulk, reducing cost and waste generation.

The private, commercial efforts toward waste reduction will be encouraged by public recognition of those business establishments that lead the way in reducing their generation of waste. This will encourage other businesses to follow the waste reduction examples set by the recognized businesses.

It is anticipated that the Waste Reduction Informational Program will continually evolve to provide information on the latest improvements and newest methods in solid waste management.

Measuring the effectiveness of the Solid Waste Information Program separately and apart from other waste reduction programs is probably not possible. The reduction in waste will be due to a combination of several programs. However, it is reasonable to expect that as much as 1.5 to 2.5 percent of the base year amount of waste may be attributable to the Solid Waste Information Program.

REUSE

Reuse is a waste reduction method which utilizes items in the waste stream which normally would be discarded and disposed in the landfill. The city will make considerable progress toward the reduction in waste disposal by thermal treatment of the sludge generated by its sewage treatment plants, then putting the treated sludge to beneficial use as a component of masonry or other similar products.. When a treatment plant does not have its own thermal treatment unit, the sludge may be transported to another treatment plant that does have an operational unit. Over the next few years the amount of sludge disposed in Atlanta's landfills will decrease until the only sludge waste disposed will be from occasional plant upsets or treatment unit outages. The City will also study alternative sludge reuse or disposal methods.

The removal of most of the sludge presently disposed in landfills should result in a decrease of approximately 17,200 tons per year of waste that would otherwise be disposed in landfills.. This amounts to an overall decrease of more than 2 percent of the base year waste tonnage disposed. The cost for this program is not included in the budget for the Bureau of Sanitary Services, but is instead in the budget for the Bureau of Pollution Control and is to be paid for in the charges for sewage service provided by the city.

The diversion of some items from the residential waste stream is accomplished by charitable organizations such as the Salvation Army, that collects items for the needy. Another example is thrift shops which take in used toys, furniture and clothing that would otherwise end up in the landfill. This waste reduction method is dependent upon promotion of those institutions in the Atlanta metropolitan area that deal in reusable items.

The reuse of other materials from residential sources that would otherwise enter the waste stream will be encouraged by the Waste Reduction Information Program. The actual weight of materials from the residential waste stream reused rather than disposed, (likely to be no more than one-half of a percent), is not included as a separate reduction item but is considered as a portion of the expected reduction in waste due to the Waste Reduction Information Program.

RECYCLING

Curbside Program

The City provides curbside recycling service to approximately 87,000 households zoned R1. This includes single family and multifamily residences up to four units. A copy of the Recycling contract is attached as Appendix D.

The city expects that the amount of waste removed due to better promotion, information distribution, effects of educational programs, and an expansion in the categories of recyclables collected (drop-off centers for magazines and corrugated), will result in a waste reduction of about 2.9 percent of base year disposal (7.61 percent of residential waste). According to the waste characterization survey that establishes the weight of recyclables in the city's residential waste stream, materials in recyclable categories account for 18.1 percent of the residential tonnage collected. This translates to a theoretical maximum of only 7.0 percent of the base year waste tonnage disposed. The city's curbside program will initially serve only the single family residences that generate about 51.5 percent of the waste (and recyclables). If 70% of this theoretically recyclable material is actually recovered, it would result in a 21,899 ton (2.57 percent of the base year disposal) reduction in disposal. This is illustrated in the calculations below:

RECYCLABLE COMPONENTS	PERCENT OF RESIDENTIAL WASTE
1. Aluminum Cans	1.1%
2. Bimetal (tin) cans	2.2
3. Glass Bottles	5.9
4. Other Glass	0.3
5. HDPE Plastic (Milk jugs)	1.2
6. PET Plastic (Soda Bottles)	0.8
7. Newspaper	6.6
TOTAL % RECYCLABLES	18.10%

18.1% X 287,933 tons (annual residential waste) = 52,116 tons

52,116 tons X .5149 (Ratio of Single Family/Total Residences) = 26,838 tons collectable

26,838 tons X 70% (collection efficiency) = 18,786 tons recoverable from the single family residential waste stream.

Although the projected percentage recycled is small (2.5%) on the basis of an overall waste amount, the percentage projected to be recycled is in the most optimistic range of any community (7.61%) on the basis of percent recycled from the residential waste stream using a curbside program.

Recycling by profit and non-profit organizations will continue to be encouraged by the city. The City will request input from these organizations to promote recycling. This private recycling activity takes place at no cost to the city.

Multi-family Recycling

This plan does not presently include a program to provide recycling services to residents of multi-family housing units. The city will develop plans and strategies to provide recycling to its citizens living in multi-family housing units. These programs are planned for

implementation in 1997. Nothing in this plan is to be presumed to prohibit the City or other entities from development and implementation of recycling programs to serve multi-family residents prior to 1997 should resources become available.

Commercial Waste Reduction/Recycling Programs

Extensive commercial recycling is already underway in Atlanta. Element Six provides information on efforts of the private sector in waste reduction and recycling. Georgia and the Atlanta area in particular has access to better markets for recyclable components of waste than many other parts of the U.S.

The commercial waste stream cannot be ignored by the City even though that waste is handled through private channels. The City must establish an information base which includes quantity and types of commercial waste generated in the City.

The city will establish procedures to measure quantities of commercial waste generated within its boundaries. These procedures may be expanded to ensure generators participate in some type of reduction program. If deemed necessary to meet state requirements, or as desired by the city, programs may be further expanded to initially encourage and then to require waste reduction. The information gathering program was described in the **Collection Element** under the heading **Private Waste Collection**.

A series of programs may be implemented by the City depending upon the need for such programs and the result of a cost/benefit analysis of the programs. The value of any such program may only be evaluated after appropriate information is gathered about the source and characteristics of the commercial waste stream.

It is anticipated that any of these programs would be carefully considered and examined for their impact upon the cost to businesses and effectiveness of waste reduction. The City will seek the counsel of the Atlanta Chamber of Commerce and others in the business community to develop plans for information gathering about commercial waste collection.

The following is a list of city programs in order of increasing governmental involvement in the commercial waste reduction programs. Time of implementation of any of the programs is a decision reserved by the City.

1. Require reporting of waste collected by all private haulers doing business within the city.
(Included as a part of this plan)
2. The City will develop strategies for multi-family recycling. One strategy to be considered will be to require commercial multi-family complexes to make on site recycling available to their tenants. This may be implemented with City Council approval in 1997 if the 1996 commercial reduction goals are not met. Multi-family complexes will also, as required by State regulation, be required to have separate collection of yard trainmen's.

3. Require that commercial businesses, of a size to be determined, participate in a reduction program of their choice and show evidence of participation. This will be implemented with City Council approval in 1999 if previously set reduction goals are not met.
4. Institute additional mandatory programs to be developed in coordination with affected parties if those previously instituted voluntary measures do not achieve satisfactory reductions.

Only the first item on the list, the reporting of waste, is to be implemented as a part of this plan at this time. The value of the implementation of other programs can not be evaluated until the waste stream information is available. If voluntary waste reduction programs prove ineffective in making suitable progress toward waste reduction goals, then the more invasive programs may be further defined and considered for implementation.

YARD TRIMMINGS COMPOSTING

As allowed by the Solid Waste Management Act, the City will enact restrictions on disposal of yard trimmings that are consistent with a proposed separate yard trimmings collection program. The restrictions may include (from 12-8-40.2):

- (1) A requirement that yard trimmings not be placed in or mixed with municipal solid waste;
- (2) A ban on the disposal of yard trimmings at municipal solid waste disposal facilities within its (the City's) jurisdiction.
- (3) A requirement that yard trimmings be sorted and stored separately for collection, composting or other handling.

The city will provide for the separate collection of yard trimmings as required by current state regulations. The yard trimmings collection program will be implemented over an eighteen month period beginning in early 1995. Initial services will be offered in areas identified as those producing the largest volume of yard trimmings. Services will be expanded over the implementation period to cover the entire city prior to September 1996..

The city may collect yard trimmings using its own forces, or it may contract for private yard trimmings collection if it so chooses. A final decision has not yet been made.

The goal of the program will be to remove 100% of the yard trimmings from the disposal stream. This amounts to over 22% of the residential waste stream and over 7.5% of base year waste disposed.

The city may choose to charge extra fees for the service of yard trimmings collection. This could defray the cost of collection, discourage the placement of yard trimmings for disposal, and encourage alternative backyard recycling and other waste reduction activities.

PROCESSING

Yard trimmings will not be disposed in land disposal facilities and will instead be shredded for mulch and/or composted. To facilitate the implementation of the program, strategically located sites will be selected for use as yard trimmings composting facilities. These facilities may be operated by the City or operations may be contracted out.

A number of facilities for the processing of waste to recover recyclables are available in the Atlanta area from several privately operated MRFs (material recovery facilities). The city does not now plan to build a separate processing facility. It is expected that material collected in the city's curbside recycling programs will be processed through one of these private facilities. This is not to preclude the city from siting and developing a material recovery facility should the city choose to do so.

SUMMARY

The various programs discussed in this element are projected to reduce the total amount of waste disposed in landfills from Atlanta by 25 percent of the total base year amount. This is summarized in table 3-1. Commercial programs will likely have additional waste reduction effects but that effect cannot now be quantified. Although Atlanta will, with considerable difficulty and expense, achieve a per capita reduction of 25 percent in its waste disposal, that percentage reduction will become increasingly more difficult to achieve as commercial growth continues and employment (and waste generation) rises while the population growth remains moderate. The costs associated with these programs are contained in Table 7.1 - Short Term Work Plan.

Table 3-1 Projected Reductions in Solid Waste Disposal from FY 1992 (Base Year) to FY 1996

PROGRAM	Operational Status	FY 1992 Tonnage (Base Year)	FY 1994 Tonnage	Tonnage Reduction from FY 1992 (Base Year) to FY 1996	Percent Reduction from FY 1992 (Base Year) to FY 1996	Percent of Base Yr. Residential Waste	Percent of Base Yr. Commercial Waste
RESIDENTIAL WASTE REDUCTION PROGRAMS							
Waste Reduction Information	Ongoing			5,758	0.8%	2.0%	0.0%
Yard Trimming Composting	4th Quarter 1995			66,223	8.9%	23.0%	0.0%
Curbside Recycling (single family)	Ongoing			21,899	3.0%	7.6%	0.0%
TOTAL RESIDENTIAL		287,933	274,946	93,880	12.7%	32.6%	0.0%
COMMERCIAL WASTE REDUCTION PROGRAMS							
Waste Reduction Information	Ongoing			9,044	1.2%	0.0%	2.0%
Sewage Sludge Thermal Treatment/Recycling	Ongoing			17,228	2.3%	0.0%	3.8%
Commercial Waste Reduction Program(s)	Ongoing			65,000	8.8%	0.0%	14.4%
TOTAL COMMERCIAL		452,229	451,004	91,272	12.3%	0.0%	20.2%
TOTALS		740,162	725,950	185,152	25.0%	32.6%	20.2%

WASTE REDUCTIONS ATTAINED IN PREVIOUS YEARS			Tonnage Reduction from FY 1992 (Base Year) to FY 1996	Percent Reduction from FY 1992 (Base Year) to FY 1996	Percent of Base Yr. Residential Waste	Percent of Base Yr. Commercial Waste
Residential Reduction (FY 1992 - FY 1994)			12,987	1.7%	4.5%	0.0%
Sewage Sludge Reduction (FY 1992 - FY 1994)			1,071	0.1%	0.00%	0.2%
TOTALS			14,058	1.8%	4.5%	0.2%

ELEMENT FOUR DISPOSAL

The goal of this planning element is:

"To ensure that solid waste treatment and disposal facilities serving local governments and multi-jurisdictional areas meet regulatory requirements and are in place when needed to support and facilitate effective solid waste handling programs today and for the subsequent ten-year period, thereby maintaining and enhancing the quality of life of the residents within the area."

PRE-DISPOSAL TREATMENT

The City does not intend to shred or bale waste collected by city forces.

THERMAL TREATMENT TECHNOLOGIES

A key element to an integrated waste management strategy is incorporating alternative disposal methods. One such alternative is waste-to-energy. Incinerating waste and generating energy has the potential to reduce the waste stream volume, leaving an ash residue. Reports and studies referenced in this Plan indicate waste-to-energy is an option the City might consider in the future.²

The city has evaluated the alternatives of waste disposal using thermal treatment methods including waste-to-energy and refuse derived fuel facilities. The Solid Waste Management Study - Phase II Report Number 1 has outlined the alternatives and discusses the advantages and disadvantages. The City will continue to monitor advancements in the technology. Presently, because of the costs associated with this technology, the City does not feel that it is appropriate to pursue thermal treatment of solid waste. Should it become appropriate to utilize waste-to-energy, material recovery would be included.

The city will continue to use thermal treatment of sanitary sewage sludge until alternative methods of disposal are determined, evaluated for suitability and implemented. Landfilling will remain a disposal option for sewage sludge and other similar waste from sewage treatment

² References recommending the consideration of the use of waste-to-energy - US EPA, National Agenda & The Solid Waste Dilemma: An Agenda for Action; The National Solid Waste Management Association; Department of Energy; The Reason Foundation's Policy Insight - Integrated Waste Management: Rethinking Solid Waste Problems and Policy Options; Keep America Beautiful's Overview: Solid Waste Disposal Alternatives; The Georgia Solid Waste Management Act; Georgia EPD Rules; Findings and recommendations by the Georgia Solid Waste Management Study Committee; Georgia DCA's Georgia Solid Waste Management Plan and Solid Waste Management Alternatives; The Atlanta Solid Waste Advisory Commission Recommendations; ARC's Regional Solid Waste Management Plan; The Atlanta Chamber of Commerce's Solid Waste Task Force, Cobb & Fulton County's Report on Incineration.

plants. Alternative sludge disposal or reuse methods will be studied by the upcoming Biosolids Disposal Review. Areas of review will include, but not be limited to, composting of sludge, land application of sludge at agronomic rates and land application in designated sites.

Thermal treatment is now being used for disposal of bio-medical waste in several large medical facilities in the city. These facilities may be expanded if the need is justified or other facilities may be brought on line as needed to satisfy the demand for disposal of bio-medical wastes. This expansion may occur only through acquisition of new permits and approval from EPD and the city.

The city will continue to make use of the Hartsfield Pathological Incinerator. This is a facility used to dispose of carcasses of animals.

LANDFILL UTILIZATION

Most residential waste collected by City forces is disposed of at the Waste Management Live Oak landfill under contract. The City plans to continue using the Live Oak Landfill, in addition to seeking additional private disposal capacity. The City will assure a minimum of five years disposal through private sites. During this five year period, the City will plan and develop facilities to dispose of waste generated within its boundaries. The City anticipates this facility will provide disposal well beyond the minimum planning period.

Non-residential waste is privately collected and transported to private disposal facilities. There is one private municipal solid waste facility operating in the City -- the Chambers Development Bolton Road sanitary landfill. There is one Price and Son's construction and demolition waste landfill facility within the City boundaries.

FACILITY MIX- EXISTING FACILITIES, PLANNED AND PROJECTED

Existing Facilities

Existing waste disposal facilities in Atlanta are described as follows:

- I. Presently, the City's existing landfill facilities are at or near their full permitted capacity with the exception of the Gun Club Road landfill. Gun Club has three to five years remaining permitted capacity, and the City has executed a contract for the closure of the facility. The City will study the feasibility of using landfill reclamation technology in lieu of closure for at least one of the existing landfill sites.
- II. The Chambers Development Bolton Road Landfill is recognized in this plan and its operation will likely continue to the limit of its permitted capacity. Presently, Atlanta Regional Commission (ARC) estimates a capacity at this site of approximately 1.1 million cubic yards.

- III. The existing, public and private construction debris and inert waste disposal sites (E. Confederate Road, city (at capacity); and the Price and Sons, Inc. (private owned facility - under closure) are recognized in this plan.
- IV. The city will maintain its present permits for sludge dryers/thermal treatment units at any and all of the city's sewage treatment plants or in close proximity to those locations.
- V. The city will continue to dispose of animal carcasses and associated waste at the Hartsfield Pathological Incinerator.
- VI. The city includes in this plan the continuation of all existing permitted incinerators for bio-medical waste where those facilities are associated with, and on the premises of a health care institution that generates the majority of waste disposed in these facilities. Specifically included by name in this plan are the thermal treatment facilities at Grady, West Paces Ferry and Georgia Baptist hospitals.
- VII. All solid waste disposal facilities, whether or not listed or described in this plan, that are properly permitted and operating at the time of the adoption of this plan or at the time of an expansion of the city's jurisdiction to include them, or their expansion into the limits of the City, with the approval of the City and State as required by law, are automatically incorporated into this plan.

Planned Facilities

Those facilities for which a permit application now exists or for which a statement of intention exists are listed below:

- I. The city may seek additional permits as needed to install sludge dryers/thermal treatment units at any and all of the City's sewage treatment plants or in close proximity to those locations. Any proposal to construct new treatment facilities will first be reviewed with the Georgia EPD Air Quality Branch to insure compliance with all State and Federal Clean Air regulations.
- II. The City will seek a permit to construct a new disposal facility at a site to be identified in the future. Any new facility will be a modern, state of the art facility meeting all requirements of federal and state regulations. The facility will contain sufficient capacity to provide the City with at least twenty years of disposal.

Projected Facilities

Those facilities for which future permitting, expansion, or modification is anticipated are listed below along with the procedures for handling potential future facilities whose locations cannot now be determined:

- I. Revisions in the existing permits, or new permits as appropriate, may be sought for the three city municipal solid waste landfill sites. Some sites might be used for disposal of

construction debris or inert waste. All the sites may be permitted for landfill reclamation, composting and processing of yard trimmings, as waste transfer points, recycling collection stations, or for other uses.

- II. New locations for construction debris or inert waste landfills may be sought by the city or by private interests without a revision of this plan. Nothing in this plan is to be construed as to prohibit the permitting of such sites, but this plan *does not* grant automatic City approval to those sites. Each proposed new site must receive approval of the City and EPD on an individual basis, but would not require a modification of this plan. The continuing need for such facilities is anticipated and is incorporated as part of this plan.
- III. New locations for municipal solid waste facilities may be sought by the city or by private interests within the boundaries of the City limits. Nothing in this plan is to be construed as to prohibit the permitting of such sites, but this plan *does not* grant automatic city approval to those sites. Each proposed new site must receive approval of the City and EPD on an individual basis, but would not require a modification of this plan. The continuing need for such facilities is anticipated and is incorporated as part of this plan.
- IV. New private and/or stand-alone thermal treatment facilities for waste disposal, independent of a health care facility, are presently not included in this plan. The approval of the city to *begin* the permitting process for such a facility must be obtained in the form of a modification to this plan that describes the location and justification for such a facility. Even with that plan modification, each new proposed waste disposal (bio-medical included) facility must receive permit approval by the City and EPD on an individual basis.

New solid waste disposal facilities, for which a modification to this plan must be made, must be recognized and incorporated into the plan by creating amendments to this section of the plan. All such amendments must repeat the same planning review, public hearing, and City Council approval as the plan itself, as is required by the regulations.

PRIVATE AND PUBLIC DISPOSAL

Individual Public Sites

There are no operating landfills under the authority of the Department of Public Works, Bureau of Sanitary Services. Previously operated sites will soon be under a closure plan as required by applicable state and federal laws.

Private Facilities

The City of Atlanta is host to one privately operated MSW land disposal facility. This landfill is located off Bolton Road in northwest Atlanta. This facility is a subtitle D constructed landfill owned by Chambers Development Company.

There is one private construction and debris site within the boundary of the city -- Price & Sons, Inc., Cleveland Avenue. Information on the capacity, site life, and daily tonnage for this facility is available in the State EPD Private Landfill report.

Landfill Closure

City operated landfills in operation on or after October 9, 1991, must be closed using methods specified in the Subtitle D regulations. The federal regulations effective October 9, 1993 requires disposal facilities to be maintained and monitored for 30 years post closure. The existing closure plans for the city's facilities that were a part of their permits, will be revised to comply with these new regulations. In drafting the revisions to the closure plans, the city will allow for the possibility of future uses of the landfills sites for other purposes where possible. These city owned sites might be used as recycling centers, compost sites, yard trimmings storage sites, or for other uses as approved.

The city will budget the cost of maintenance, environmental monitoring and reporting for each of its existing landfill facilities for the required 30 year post-closure period as required by the regulations. Funds will be allocated at the appropriate budget cycle after the closure of each site. Estimates of closure and post closure cost are found in the table below. Design and construction of facility closure will begin in 1995.

Table 4-1 Landfill Closure 1995-1998/Post-Closure Cost Estimate

LANDFILL	Acres	Closure Cost (design & const)	# Mon. Wells (est.)	Annual Monitoring Cost	Annual Maintenance Cost	30 Year Total Cost
Cascade Rd.	31	\$7,000,000	8	\$40,000	\$36,500	\$9,295,000
Key Rd.	100	\$8,500,000	20	\$100,000	\$105,500	\$14,665,000
Gun Club Rd.	110	\$9,000,000	25	\$125,000	\$115,500	\$16,215,000
E. Confed.	6	\$500,000	0	0	11,500	\$645,000
TOTALS	247	\$25,000,000	53	\$265,000	\$269,000	\$41,020,000

Notes:

1. These estimates reflect material and third party costs associated with closure of the landfills. Number of monitoring wells required may vary depending on preliminary design. Required city personnel costs not included.
2. E. Confederate closure cost is estimated separately from the other facilities and presumes that negligible monitoring and maintenance cost will be required.
3. Closure of all sites will begin in 1995. The five year plan for closure expenditures is shown in table 7-1.

DEDICATED WASTE HANDLING FACILITIES

The city does not intend to provide special handling facilities for special characteristic waste such as tires, oil or other materials, but will encourage private enterprise to increase the city's and the area's access to such facilities.

The City will research alternatives available with different dedicated facilities and will revise this plan as needed, and according to regulations to allow those dedicated facilities that serve a beneficial public need.

Tires

One facility in the city is in the business of receiving whole tires. Tires are chipped or shredded and transported to their respective markets outside the City.

Bio-Medical Waste

Existing bio-medical waste incinerators are located at Grady, West Paces Ferry and Georgia Baptist hospitals in the city.

ELEMENT FIVE LAND LIMITATION

The goal of this planning element is:

"To ensure that the proposed solid waste handling facilities are sited in areas suitable for such developments, are compatible with surrounding uses and are not considered for location in areas which have been identified by the local government or multi-jurisdictional area as having environmental or other land use limitations."

In evaluating a site for suitability as a waste handling facility, the procedure typically involves the choice of several presumptive sites from the large scale map showing geological criteria that show areas more or less excluded from landfill development. For each presumptive site, its suitability is then evaluated on an individual basis according to the other criteria listed. It is beyond the scope of this plan to provide an exhaustive evaluation of every parcel of an entire jurisdiction as to its individual suitability for waste handling facilities. These criteria are listed to provide guidance to the city and to others in criteria for site evaluation that must be taken into account due to regulatory authority.

NATURAL ENVIRONMENTAL LIMITATIONS

Solid waste disposal facilities and, to a lesser extent, other solid waste handling facilities should be located where they are least likely to have any adverse effect. This plan in no way attempts to declare any site as acceptable, neither does it presume to declare any site as unsuitable based on non-specific criteria discussed herein. Siting of facilities must be accomplished on a site specific basis. Items to be considered for siting of waste management facilities according to state planning guidelines are:

- Floodplains,
- Wetlands,
- Groundwater Recharge Areas, and
- Other criteria such as:
 - Water Supply Watersheds,
 - Fault Zones,
 - Seismic Impact Zones, and
 - Unstable Areas [Karst Areas]

Floodplains

The state solid waste regulations and now federal RCRA Subtitle D require that no solid waste handling facility be located so as to restrict the flow of the 100 year flood, reduce the temporary water storage capacity of the floodplain, or result in the washout of solid waste.

Wetlands

State regulations and now federal RCRA Subtitle D prohibit the location of landfills in wetlands unless very stringent conditions are met and demonstrations of site suitability are made. Practically speaking, unless the U.S. Corps of Engineers approves of development plans that affects wetlands, they may not be used for waste handling facilities.

Groundwater Recharge Areas

Groundwater recharge areas are areas that are recognized by the Georgia Geological Survey (as shown on Hydrogeologic Atlas 18) as being areas through which surface water travels to become a groundwater resource. These areas should be protected from potential contamination from any source including solid waste handling facilities. State law restricts the location of solid waste disposal facilities in these areas and for a two mile buffer from such areas to facilities with liners and leachate collection systems. New facilities are prohibited in these areas if extra-jurisdictional waste is accepted. As a practical matter, groundwater recharge areas and the two mile buffer from them should be avoided, if possible, unless geological conditions indicate a groundwater flow from the proposed facility away from the direction of the groundwater recharge area.

Water Supply Watersheds

Regulations have been enacted that restrict the location of solid waste handling facilities to protect water supplies from potential contamination. According to regulations of the Department of Natural Resources Part V 391-3-16-01:

No solid waste handling facility should be located in the 100 foot buffer on each side of perennial streams seven miles upstream from a water supply intake or reservoir (and in small watersheds beyond the seven miles, a 50 foot buffer).

No solid waste handling facility impervious surface should be located in the 150 foot setback on each side of perennial streams seven miles upstream from a water supply intake or reservoir (and in small watersheds beyond seven miles, a 75 foot setback).

For small watersheds (less than 100 square miles) new municipal solid waste landfills must have synthetic liners and leachate collection systems.

No solid waste handling facility should be located in the 150 foot buffer surrounding water supply reservoirs.

Fault Zones - Seismic Impact Zones - Unstable Areas [Karst Areas]

The State of Georgia requires that a hydrogeological assessment be made of the location of any proposed solid waste disposal facility. In that assessment, which is required to be performed under direction of a registered geologist or professional engineer, those technical issues that involve seismic activity, fault lines, unstable areas, and karst areas must be evaluated at the earliest portion of regulatory review (site suitability study) any condition that is likely to result in a significant increase in the possibility of the escape of pollution from a site will not receive the approval of EPD for a continuation of the permitting process.

The overall purpose of the requirement for hydrogeological assessments is to assess the potential risk of contamination of groundwater supplies by the proposed facility. The EPD and the Geological survey require site acquired data (soil borings) as well as a search of the literature about the geological aspects of the area, before approving further progress toward permitting a disposal site.

LAND USE LIMITATIONS

When considering the location of all solid waste handling facilities including landfills, the items to be considered, according to state planning guidelines are:

- Land Use/ Zoning Restrictions
- Built-up Area (Heavily Developed Areas)
- Distance from a National Historic Site
- Proximity from Airports
- Distance from Jurisdictional Boundaries
- Access

Land Use Plan/Zoning Restrictions

Current Land Use Plan/Zoning Restrictions (December 1994)

Zoning regulations that govern the City of Atlanta are found in the Atlanta Zoning Ordinance. This document is updated from time to time, with the most recent edition being available in the Municipal Clerk's office. The zoning classification of individual properties can be obtained from the Bureau of Buildings, Zoning Enforcement Division.

The following table indicates the zoning classifications in which certain solid waste facilities can be located.

Table 5-1

Zoning Restrictions for Private Solid Waste Management (as of December 1994)		
Facility	Districts Allowed	Districts Allowed by Special Use Permit
Construction/Demolition Disposal		R-1,R-2,R-3,R-4,R-5
Inert Waste		R-1,R-2,R-3,R-4,R-5
Sanitary Non-Hazardous		I-1, I-2
Recycling Incidental to Other Activities	In District of Main Enterprise	
Stand Alone Operations Processing, Transfer, Storage		I-1, I-2
Biomedical Thermal Treatment Facilities	Ancillary Use with Medical Facilities	I-1, I-2
Thermal Treatment	Not Addressed	Not Addressed

As the above table illustrates, thermal treatment facilities are not specifically dealt with under present zoning regulations. Biomedical waste thermal treatment units are allowed in zones for the medical care facilities they serve, provided these facilities are located on the same lot that is zoned for a medical facility. Stand alone thermal treatment facilities and any commercial biomedical waste incinerators require a special use permit and must be located in I-1 or I-2 zoning districts.

The zoning ordinance identifies specific criteria used to determine whether a request for a special use permit complies with existing zoning standards. Noise, odor, proximity to neighborhoods, visual aesthetics to the surrounding community, egress and ingress and hours of operation are examples of criteria used to determine compliance.

As previously stated, the existing zoning ordinance does not adequately address certain solid waste facility issues. Therefore, the Bureau of Planning should actively pursue updating the zoning ordinance to establish more effective guidelines to regulate these uses. Any changes to the City's zoning ordinance that occur subsequent to City Council approval of this Solid Waste Management Plan will automatically become incorporated into this document.

National Historic Sites

The review officer for the City is the Mayor and he or she designates the appropriate reviewer, either the State Historic Preservation Office or the City's Urban Design Commission. If Federal or State money is involved the state Office of Historical Preservation is the official reviewer of the historic element. The designated reviewer should examine the national Register and the City's inventory, the latest version of which was published in 1987 to make a determination of the historic designation of that site or building in question.

Districts and sites should be consulted in Atlanta's official inventory, the City's latest version of which was published in 1987 titled Atlanta's Lasting Landmarks.

Districts and Sites on the National Register of Historic Places

No solid waste handling facility should be located in, adjoining to or negatively impacting a district or site in the National Register. In the City of Atlanta there are many such sites. Examination of the National Register to make a determination of the proximity of any of the districts or sites on the register should be made for each proposed site for a new solid waste handling facility during the site suitability phase of the planning for a facility.

Surface Water Intakes

To be located within two miles of a surface water intake for a public drinking water source, new solid waste landfills must have engineered modifications such as liners and leachate collection systems and groundwater monitoring systems. Unless such a location close to a surface water intake is the only feasible location, other locations should be considered.

Table 5-1 Land Limitation Summary

Area of Limitation	Type Facilities Affected		
	MSW Landfills	Other Disposal Facilities	All Handling Facilities
Planning and Zoning	*	*	*
North Chattahoochee Corridor	*	*	*
South Chattahoochee Corridor	*	*	*
Water Supply Watersheds	*	*	*
Groundwater Recharge Areas	*		
Wetlands	*	*	*
1/2 Mile of County Boundary	*	*	
National Historic Sites	*	*	*
Flood Plains	*	*	*
Airport Vicinities	*		
Surface Water Intakes	*		
Hydrological Assessment	*	*	
Nature Preserves	*	*	*
National Register Sites	*	*	*
Scenic Views	*	*	*
Endangered Plants, Animals and Biological Communities	*	*	*
Archeological Sites	*	*	*

Proximity to Airports

Georgia Regulations and federal RCRA subtitle D Require that municipal solid waste landfills may not be located within:

- 10,000 feet of any runway used or planned to be used by turbojet and piston-type aircraft;
- 5,000 feet of any runway used or planned to be used by piston-type aircraft only.

Subtitle D additionally requires that owners or operators proposing to site new municipal solid waste landfill units and lateral expansions within a five-mile radius of any airport runway end used by turbojet or piston-type aircraft must notify the affected airport and the Federal Aviation Administration (FAA).

Scenic View or Vista

No solid waste handling facility should be located in such a way as to negatively affect a scenic view or vista as defined in local comprehensive plans. This was not investigated with respect to planning agencies serving Atlanta but should be evaluated on a site specific basis for any site proposed as a waste handling facility.

Nature Preserves as Identified in the Regional Development Plan

No solid waste handling facility should be located in, adjoining or negatively impacting a nature preserve. A list of these facilities and location information about these facilities are available at the Atlanta regional commission office.

Habitat of Rare, Threatened and Endangered Plants, Animals and Biological Communities

No solid waste handling facility should be located in such a way as to result in the destruction of the habitat of rare, threatened and endangered plants, animals and biological communities as identified in the Georgia Natural heritage Inventory by the Department of Natural Resources.

Archaeological Sites

No solid waste handling facility should be located so as to negatively impact an area of concentrated known archaeological sites on file at the University of Georgia.

Chattahoochee Corridor

For the Chattahoochee River, from Buford Dam to Peachtree Creek, within 2,000 feet of the river and its impoundments, no new or expanded existing solid waste handling facility should be located in order to protect the water quality of the river and the scenic vistas and places in the corridor.

Within 640 feet beyond the 2,000 foot corridor, where the river is a boundary between two counties, no new or existing solid waste disposal facility expanded into the 640 foot area should be located without the approval of the adjoining county.

For the Chattahoochee River south of Peachtree Creek, within 100 feet of the river, no new or expanded solid waste handling facility should be located as these are not permitted uses under the Rivers and Mountains Protection Act.

In the 2,540 feet beyond the 100 foot corridor, as the river is a county boundary, no new or existing solid waste disposal facility expanded into the 2,540 foot area should be located without the approval of the adjoining county.

Much of this Chattahoochee River corridor is in Atlanta and restricts development close to the river.

FACILITY SITING RESOURCES

Maps are available showing many (but not all) of the characteristics adverse to siting of solid waste handling facilities and particularly landfills. Maps are available at the ARC office for the Atlanta area for the following:

The City of Atlanta, along with most if not all of the rest of the state has been surveyed by the USGS to prepare maps of the area showing the following limitations on location of solid waste handling facilities:

USGS 1:100,000 scale

1. Slopes Greater Than 25%
2. Water Bodies and Wetlands Land Use
3. Streams and Lakes
4. Federal, State and Public Lands
5. Recharge Areas
6. Poorly Suited Soils
7. Municipal Water Supplies
8. Urban and Built-Up Lands
9. Major Highways, Roads and Airports
10. A Composite Map (of 1-9 above) Showing Areas Considered Geotechnically Poorly Suited for a Sanitary Landfill

Other maps available at ARC include

1. Water Supply Watersheds
2. Nature Preserves
3. USGS Quad Sheets for Wetlands Identification
4. Areas of Concentrated known Archeological Sites
5. Airports
6. One-Half Mile from County Boundaries
7. Chattahoochee River Corridor - Buford Dam to Peachtree Creek
8. Chattahoochee River (south of Peachtree Creek) and South River
9. Probable Areas of Thick Soils (possibly significant groundwater recharge areas)
10. 1991 Area of Urban Development

These maps include only those criteria indicated. Some of the location criteria are not included on these maps and are not shown on the composite map. Each proposed site should be evaluated for all items indicated in this section not only those criteria for which maps are conveniently available.

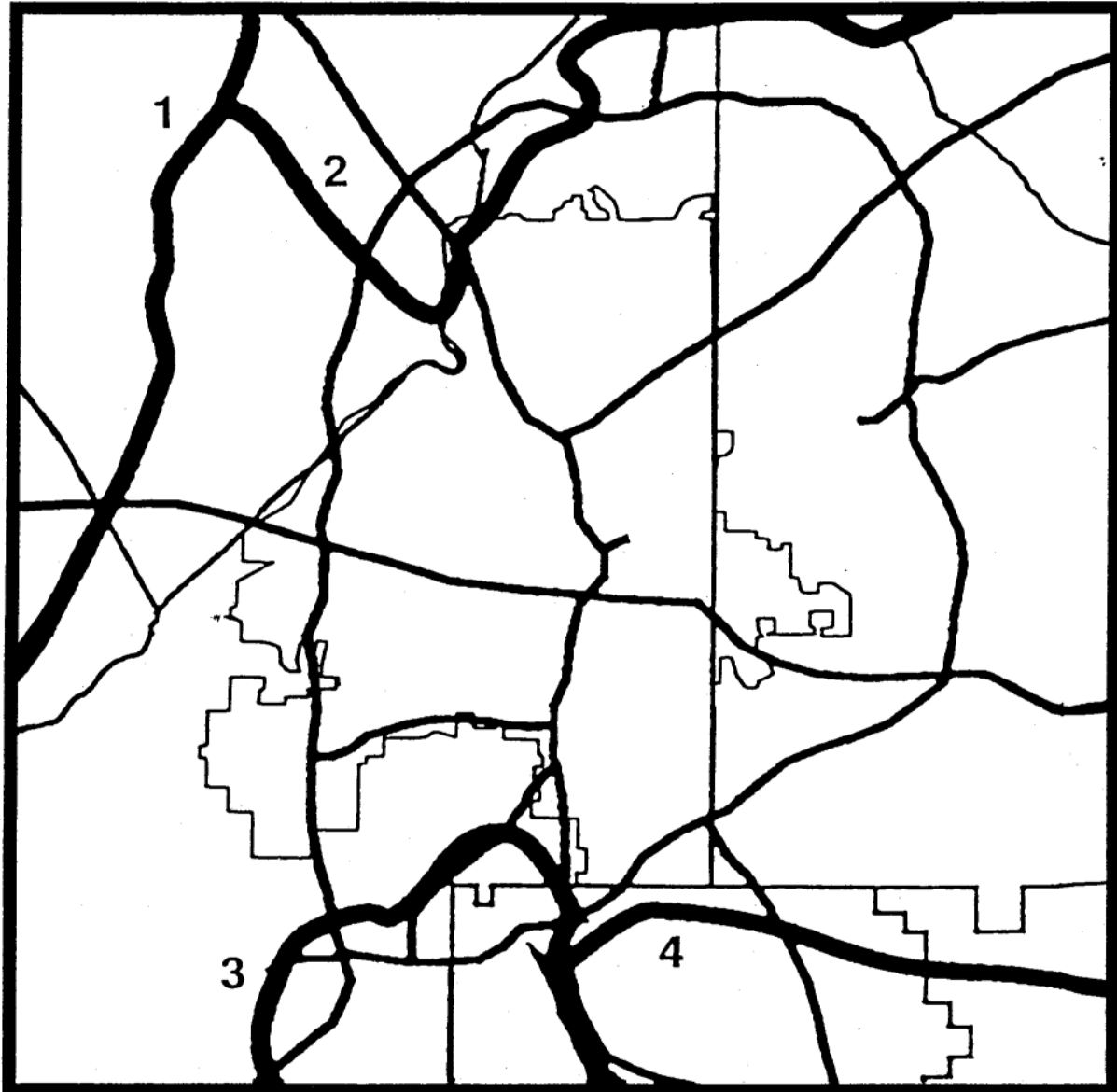
The location of solid waste disposal facilities in or at prescribed distances from areas that contain any or several of the above characteristics is not usually indicated. However, the maps are only an aid to locating sites and are not precise enough to rule out any site. The adverse characteristic indicated by the map should be confirmed to exist at the proposed site before the site is discarded. Any special condition that may exist should be evaluated that could allow the site to be suitable for use as a disposal site.

A copy of each of these maps, at a reduced scale, can be found in the Atlanta Region Solid Waste Management Plan. The reduced scale maps do not show enough detail to evaluate specific locations. For information on specific locations, the original, full scale maps, available at the ARC office should be used.

From a review of these maps (particularly the composite map), it can be seen that the land areas remaining, after removing from consideration those areas with identified adverse characteristics, are very few and limited in area. If any site is proposed as a disposal facility that is within the areas shown as having adverse characteristics, it must be discarded as a suitable site unless it can be demonstrated that the conditions resulting in its inclusion are not valid.

Atlanta Region

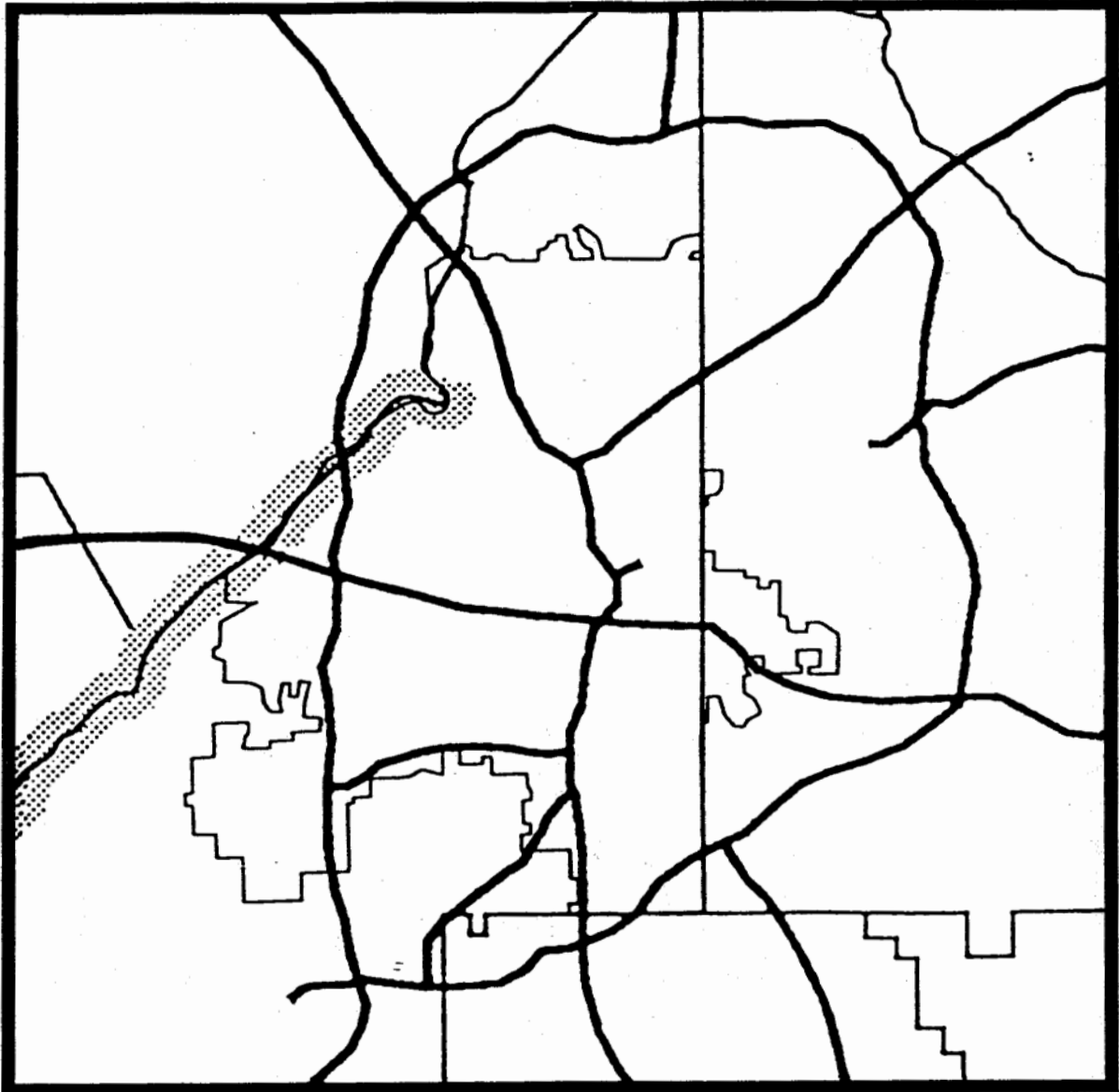
Water Supply Watersheds



1. Sweetwater Creek
2. Chattahoochee River
3. Flint River
4. Big Cotton Indian Creek

Atlanta Region

Chattahoochee River



Notes: 1. Chattahoochee River south of Peachtree Creek.
2. 100 Foot protection Buffer.

Atlanta Region

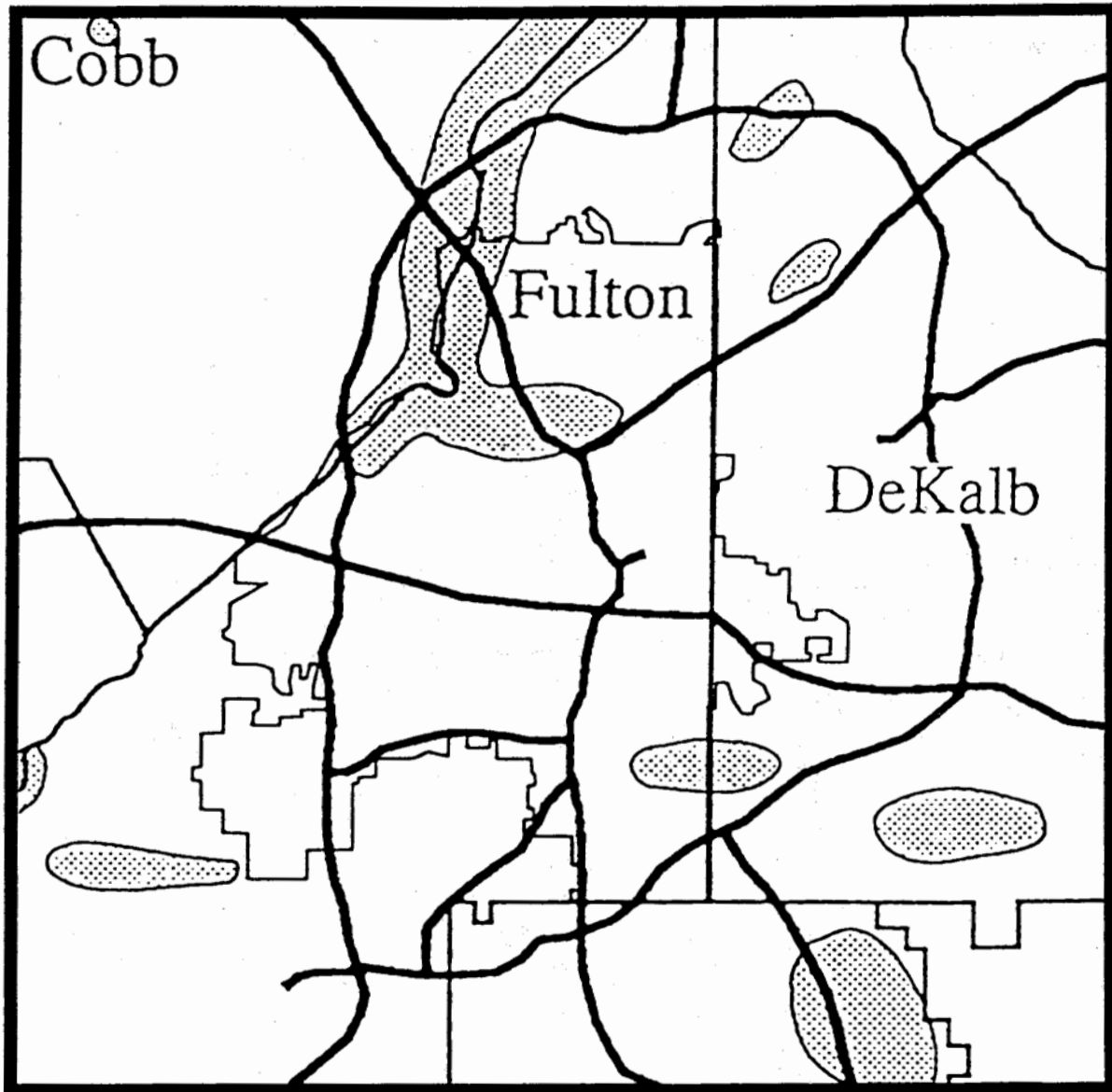
Chattahoochee River Corridor (North of Peachtree Creek)



Note: 1. 2000 Feet From the River and its Impoundments.

Atlanta Region

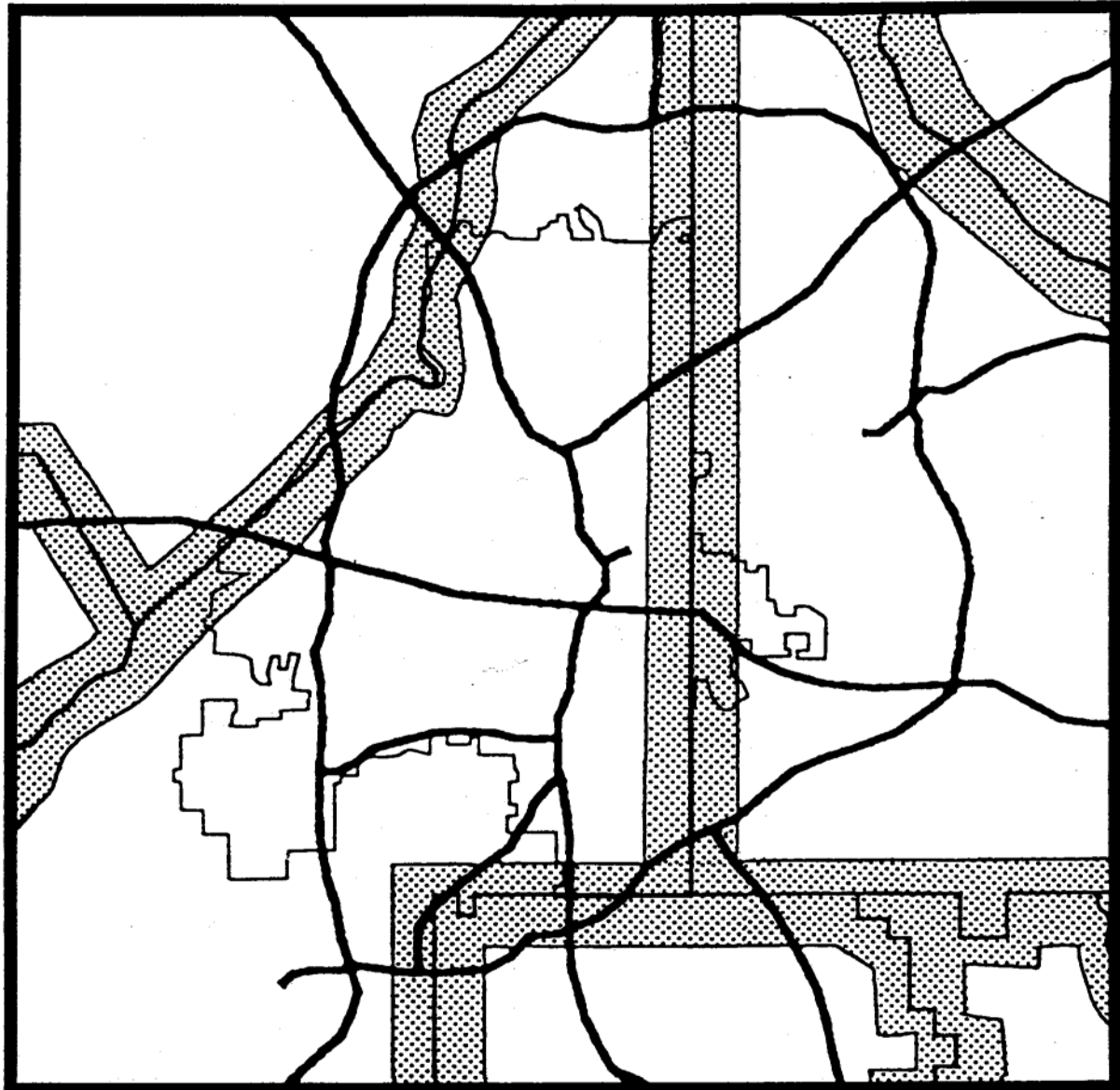
Areas of Concentrated Known Archaeological Sites



Note: On file at the University of Georgia.

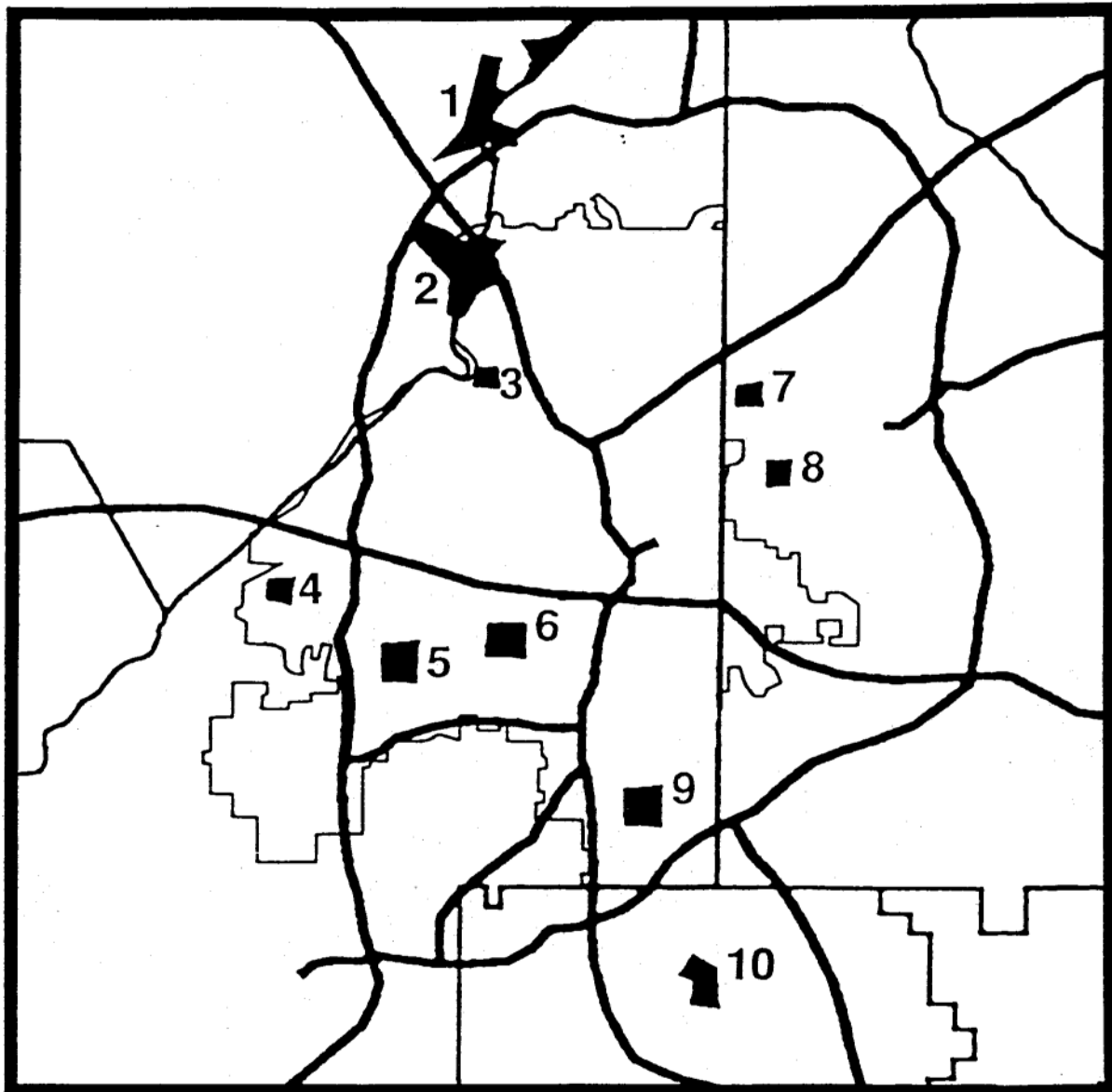
Atlanta Region

One-Half Mile From County Boundaries



Atlanta Region

Nature Preserves



1. Cochran Mill / Slope
2. Palisades
3. Standing Peachtree
4. Wilson Mill
5. Cascade

6. Richland
7. Johnson
8. Fernbank
9. Southside
10. Reynolds

Negative Mapping - Document provided to Department of Community Affairs (DCA) by Atlanta Regional Council during review process. It is available for review at 55 Trinity Avenue, Suite 4800, Atlanta, GA.

ELEMENT SIX**EDUCATION AND PUBLIC INVOLVEMENT**

The Education and Public Involvement Element is the sixth of the seven elements which comprise the solid waste management planning process. The goal of this element is to identify the resources presently available to help the residents of the City of Atlanta grasp the social and environmental issues, problems, concerns, and needs associated with solid waste management, particularly in terms of littering, source reduction, recycling, reuse, disposal of household hazardous waste, composting, energy recovery, and disposal, and to propose future programs as well.

Descriptions of the many existing educational and public involvement programs are divided into the following categories:

- Advisory Groups
- Technical Assistance, Seminars and Lectures
- Related Education and Public Involvement Programs
- Private Sector Involvement; Education Outreach
- Media
- Schools and Curriculum
- Funding for Educational Programs
- Educational Materials

Education in solid waste management issues aids in changing established behavior, strives to sustain public interest, and fosters citizen participation in effective, economical, and environmentally sensitive solid waste handling applications.

ADVISORY GROUPS**Atlanta Solid Waste Advisory Commission**

The City of Atlanta Solid Waste Advisory Commission was formed in the spring of 1989 by resolution of the Atlanta City Council in order to recommend a city policy on solid waste management to the Mayor and City Council. The Commission was divided into four working subcommittees:

- Education
- Waste Minimization
- Recycling and Composting
- Waste Processing and Disposal

The commission contained a cross section of residents who achieved consensus on solid waste policy through a careful study of issues. The report issued by this commission was presented to

the City in January of 1991, and included short and long term recommendations for solid waste management.

The commission strongly urged the City to commit the funds needed to assure a broad, comprehensive education and public awareness program, endorsing the viewpoint that funds spent on education would save money by ensuring the effectiveness of the solid waste management program. The group recommended the addition of one full-time employee to coordinate the education and public awareness initiatives. The Department of Public Works supports this recommendation and continues to propose the creation of an additional position of Environmental Education Specialist, most recently in their 1994 budget submission. Funds were appropriated in the 1993 budget to support an education effort in conjunction with the city-wide expansion of the curbside recycling program. Other recommendations from the Education Subcommittee report are incorporated into this element of the Solid Waste Management Plan.

Drafts of the technical portions of this document have been discussed at two public hearings which included members of the Solid Waste Advisory Commission as well as representatives from the environmental community.

Atlanta Clean City Commission

The Atlanta Clean City Commission (ACCC) is modeled after a national litter reduction plan developed by Keep America Beautiful, Inc., a private organization with headquarters in Stamford, CT. Certified in 1976 as the local KAB affiliate, the focus of the ACCC since then has been primarily educational, but their program has grown beyond the subjects of litter reduction and neighborhood beautification to include recycling and general solid waste management issues and education.

ACCC is made up of volunteer board members appointed to serve by either the Mayor or a City Council representative. The board represents a cross section of community residents with no particular technical background in solid waste issues per se, but with a desire to contribute common sense thinking and planning, writing, speaking and organizing talents. Their most important contributions are their energy and willingness to serve on many community projects. Seven committees initiate and carry out special projects in the following categories:

- Business & Industry
- Community Organizations
- Educational Institutions
- Communications
- Recycling
- Fund Raising
- Municipal Operations

Programs include cleanup projects, recycling drives, teacher training workshops, community presentations and other efforts to seek the active involvement of interested persons. Volunteers are encouraged to participate freely.

Other Groups

The City of Atlanta has sought and will continue to seek counsel on specific solid waste projects from external environmental and educational groups such as the Solid Waste Education Project of the Atlanta Audubon Society, the Sierra Club, the Georgia Environmental Organization, the Atlanta Public Schools, and the Georgia Department of Community Affairs.

TECHNICAL ASSISTANCE, SEMINARS AND LECTURES

City staff receives technical assistance in its program planning, organization, education, research and development efforts from state and federal agencies as well as memberships in the Solid Waste Association of North America, the National Recycling Coalition, the U. S. Conference of Mayors, Public Technology Institute, the Institute of Solid Waste of the American Public Works Association, and the Georgia Recycling Coalition. These memberships provide educational and research opportunities for staff actively involved in community participation issues and are a recommendation of the Atlanta Solid Waste Advisory Commission. In addition, members of this Department monitor state legislative issues and the work of the Georgia Municipal Association on solid waste legislation.

City staff provides technical assistance through periodic recycling neighborhood canvasses, the development of instructional material to support its curbside recycling program, and the maintenance of two telephone hot lines. In addition, hundreds of calls and written requests for information and materials are answered each year.

The education budget appropriated to accompany the curbside recycling expansion is used for media, printing, and production costs. It is hoped that this amount will continue to be appropriated on an annual basis in order to support waste reduction education, particularly in conjunction with a planned program to compost yard trimmings.

Atlanta Clean City Commission receives technical assistance from Keep America Beautiful, Inc., and from the State of Georgia Department of Community Affairs, the local agency responsible for program oversight. In order to maintain KAB certification, ACCC must submit an annual cost/benefit analysis report which includes a summary of all donated volunteer hours, goods and services, and must complete an annual photometric index as a measure of litter in the City.

The Atlanta Clean City Commission provides technical assistance to local government, schools, businesses, civic groups and individuals in the community through its speaker's bureau, the Waste In Place teacher training seminars held in conjunction with the Department of Public Works, and through the provision of educational brochures and videos. The ACCC provides support services such as instruction guides, trash bags, volunteers, and fliers for neighborhood clean-up campaigns as well.

The ACCC receives a annual budget amount of \$75,143.00 from the City of Atlanta for two salaries, benefits, and vehicle maintenance. This amount includes only \$6,000.00 for administrative costs; the City budget does not provide funds for printing, training, or any program expenses. The ACCC raises a cash supplement of approximately \$8,500.00 per year for programs, and solicits approximately \$527,860.00 in donated goods and services, plus an additional \$62,000.00 in donated volunteer hours, a ratio of private to public expenditure of 7.65 to 1.

The ACCC is investigating the installation of an Environmental Hotline, a free, city wide recycling and environmental information telephone service. This hotline is based in Houston, Texas, and will provide access to citizens 24 hours a day, seven days a week. The service already has been installed in a number of other major cities and will be implemented in Atlanta once a media sponsor is identified. The cost is \$163,400.00 for the first year, and \$125,000.00 per year thereafter. Potential sponsors are being asked to heavily promote the telephone number and the ACCC name, using their media outlet. It is hoped that a sponsor will be identified in 1995.

RELATED EDUCATIONAL AND PUBLIC INVOLVEMENT PROGRAMS

The Atlanta Audubon Society (AAS) is the local chapter of National Audubon Society. In 1991 and 1992, AAS assisted the city in door-to-door canvasses of 1,550 households in two neighborhoods which are part of the city's curbside recycling program. The general purpose of these canvasses was to encourage participation in the program as well as to inform residents about what materials were being recycled and how to prepare the items.

AAS has also launched a Backyard Composting Education program which provides a 30 minute slide presentation, brochures and educational exhibits for organized groups, festivals, and other events. The slide presentation teaches residents how to turn yard and food trimmings into compost and how to put the compost to use in their yards. This program also supplies compost bins at a nominal cost.

The Atlanta Zoo has established a recycling and composting exhibit for the public, with the assistance of Home Depot. Internally, the Zoo has a Conservation Shed where recyclable materials such as cans, computer paper, white ledger paper and telephone directories are accepted from their employees. Office paper recycling is in place at each desk. The Zoo has twelve functioning compost bins to accept yard trimmings from the grounds and has a chipper/shredder which chips foliage used for mulch in the Rain Forest Exhibit.

The Outdoor Activities Center (OAC) is located in a twenty-six acre regrowth forest on the edge of the West End Historic District in Atlanta. The OAC is Atlanta's first and only inner-city learning facility and was founded in 1975 by local citizens. The Center is now the property of the City of Atlanta Department of Parks, Recreation and Cultural Affairs; it is managed by a professional staff and guided by independent trustees. The mission of the OAC is to promote an ecologically responsible community by educating and involving children and adults in the

areas of conservation, ecology and the natural environment. The OAC is currently developing a compost demonstration site and a "No Wasted Leaves Community" pilot program. OAC promotes the composting of yard trimmings at home and school, and currently exhibits home composting and worm bins as part of their educational program.

Shop Smart Consumer Preference Program

This program, developed by City staff in 1994, with implementation scheduled for 1995, is designed to be a component of the recycling program by educating and encouraging citizens to make perceptive and conscientious purchasing decisions, since what is disposed of as waste is a product of what is purchased. The criteria to be developed by this program include the concepts of recyclability, marketability, composition, reusability, and the reduction of waste. The City of Atlanta Solid Waste Advisory Commission report recommended the development of a consumer guide to responsible consumption and disposal.

Briefing documents for the Shop Smart program will be prepared and reviewed by community education representatives; brochures will be printed for public distribution to APAB, NPUs in program areas as they come on line, to recycling projects such as Spring and Fall into Recycling, and used in conjunction with teacher training and canvass efforts.

The focus of the project will be:

1. To REDUCE the volume of what is bought (minimal packaging, larger quantities).
2. To REUSE what can possibly be reused.
3. To RECYCLE as much as possible (purchase products in packaging which can be recycled in the City of Atlanta curbside program; avoid composite packaging).

These consumer preferences will be developed as public policy and communicated to the public for implementation.

The U.S. Environmental Protection Agency has endorsed these criteria and has supported the purchase of products made with recycled materials in addition to products which can be repaired. In conjunction with this program City staff will continue to work with the Bureau of Purchasing and Real Estate to support wider implementation of Mayor Campbell's Administrative Order 94-4 on procurement of products with recycled content.

A supplement to this guide will provide a list of area organizations and businesses which support the reuse of household products, such as second-hand stores, consignment shops, thrift shops, repair and refurbishing shops, non-profit charities which sell used household items, and used goods exchanges. This information will either be part of the Shop Smart material or will be presented separately as a "Use It Again" effort.

Litter Control Program

Clean City Commission support for many neighborhood clean-up projects over the past eighteen years, together with their distribution of educational material on litter control, has produced a change in the habits of Atlanta's citizens and a change in attitude regarding individual responsibility for litter control.

Actual progress in litter control is measured during the same season each year by a photometric index. This study applies mathematical criteria to 120 areas across the city where litter is likely to accumulate, such as block faces, vacant lots, parking lots, loading docks, commercial refuse storage sites, and so on. This index is a requirement of a Keep America Beautiful affiliate. The latest data indicate a 64% reduction in litter between 1991 and 1992.

Special Promotions

Several ACCC projects have become traditions, while others have occurred only once. The Awards luncheon held each year recognizes citizens who have made exemplary contributions to a more wholesome environment in Atlanta and presents awards for solid waste education, recycling, and beautification to individuals, business and industry, the communications industry, community organizations, municipal operations, and the educational community. The Downtown's Picking Up project, Spring and Fall Into Recycling, and the Glad Bag-A-Thon have been held at least four consecutive years, and some projects more frequently. The telephone book recycling project diverted 1,016 tons of directories from area landfills in 1992, doubling the Bell South corporate goal for the program and recycling 12% of all directories distributed during the first year of the program. During the second year, 845 tons were collected. The Christmas Tree Recycling project collected 10,000 trees, diverting 75 tons of wood waste from the landfills in 1992 and 90 tons in 1993. The ACCC worked with the Bureau of Cultural Affairs to produce the area's first litter-free event at the Atlanta Jazz Festival in June of 1993.

Although special promotions adjust and reinforce citizen behavior, the ACCC is reluctant to add new annual or biannual promotions at this time because of staff and budget constraints. ACCC focus has now shifted to greater involvement with and promotion of long-term solid waste management solutions as opposed to periodic project work, particularly those related to legislation and enforcement. In addition, the creation of a publicity campaign designed to bolster the commitment all citizens must make to litter-free living, reuse of household materials, waste reduction and recycling is now this Commission's top priority.

PRIVATE SECTOR INVOLVEMENT, EDUCATION OUTREACH

The private sector in Atlanta has responded to the interest and economic benefits of sensible waste management with many recycling and reuse programs. The Atlanta Chamber of Commerce has organized a Waste Management Task Force to address issues related to waste generation and disposal. In addition, the Chamber will assist in the development of solid waste education materials and has published and continues to distribute a book of instructions on the

development of commercial recycling programs for property managers and owners of single and multi-tenant buildings.

The Chamber's Northeast branch has adopted the subject of environmental issues as their top priority and has formed a committee to recruit Atlanta area businesses to start recycling programs. 89 companies have initiated office paper recycling programs since the onset of this drive in March, 1992; on-site advice, education and information about recycling is provided as part of the program.

Some significant examples of corporate programs in Atlanta are those at AT&T, Coca Cola, and Georgia Power, all of which provide environmental education programs and stress environmental responsibility in conjunction with their in-house recycling. The recycling program at Coca Cola headquarters accepts material which employees have brought from home and has reduced waste pulls from one per day to one per week. The 22,000 employees of AT&T recycle pallets, aluminum cans, corrugated, twenty-four types of office waste paper, household batteries, laser cartridges, newspaper, telephone books and microfiche film, and are cooperating with the Alpharetta Clean and Beautiful program in a household battery recycling effort. The waste generated by AT&T in the metropolitan area has been reduced from seven pulls each week to two.

The Atlanta Journal/Constitution established a recycling hot line in June of 1991 to provide environmental information and supply drop-off recycling locations for the general public in their readership area. The site data was obtained from the Sierra Club Recycling Directory and is updated periodically. The City of Atlanta refers site questions to this hot line rather than duplicating the data base at City Hall. The hot line number is printed on the front page of both newspapers every day. The program handles slightly more than 1,000 calls each month on average. (last six months 7,454).

Many corporations develop solid waste and recycling materials and videotapes and contribute them to the City and the Clean City Commission free of charge. The City has distributed several hundred copies of the Georgia Power "Guide to Recycling," and also regularly distributes recycling material funded by WZGC, WXIA-TV, WPCH, Browning Ferris Industries, and Waste Management.

Browning-Ferris Industries, the current City recycling contractor, is participating in the Chamber of Commerce Business Education Partnerships, an offshoot of the former Adopt-A-School program which has established over 350 business/school partnerships. This program is funded by the Atlanta Public Schools and the Atlanta Chamber of Commerce and places volunteers in the schools for tutoring or mentoring. BFI has donated copies of their Mobius Solid Waste curriculum to all teachers in their partnership school, Usher Middle School, has brought the Mobius recycling character to visit, and has supported the Blalock Career Day project with information on waste management.

This Chamber of Commerce program has agreed to support and promote Waste In Place training through their Business Education Partnership. Partners will be asked support and

underwrite the attendance of their volunteers at Waste In Place training workshops so that they can take the message directly to the public school students they tutor. The Chamber offers waste in the workplace training as well.

MEDIA

Media coverage has generally been the purview of the Atlanta Clean City Commission, with assistance from the Office of Communications and Marketing. Currently, the ACCC is working with WXIA-TV which has produced and is currently running public service announcements on litter control and the sign ordinance.

Channel 11 also sponsors and coordinates other ACCC projects such as Spring/Fall Into Recycling, and provides news coverage on these projects and other environmental projects not directly under their sponsorship or coordination. This station currently has the most productive relationship with the ACCC on environmental issues.

Other media outlets cooperate as well: WSB-TV is the official sponsor of the Christmas Tree Recycling Project. Georgia Power, BellSouth and Coca Cola have paid for advertisements for group projects which involve Atlanta as well as the metropolitan area. Atlanta radio stations have promoted Clean and Beautiful projects with public service announcements, but prerecorded interviews and reports of ACCC activities are unfortunately run at off hours when there are fewer listeners.

The Atlanta Constitution often prints environmental articles and information in their Intown Extra section. The Clean City Commission publishes a bi-monthly newsletter with a circulation of more than 1,000.

City staff, with cooperation from the Clean City Commission and the Mayor's Office of Communications, developed an advertising campaign to support expansion of the curbside recycling program in the fall of 1993. This campaign included the development of program-specific art, logo, slogan, designs for print media and production of a 60-second radio commercial. A major Atlanta advertising agency provided the concept, layouts, radio script and media plan for this campaign on a pro bono basis, and assisted the City by providing accurate production costs for the preparation of a budget for paid media. The campaign started one week prior to the onset of collections for the expanded program. The following media were purchased and run over a seven-week period:

RADIO: 442 spots on seven stations.

8-SHEET BILLBOARDS: 100 locations.

BUS SHELTER CARDS: 35 locations.

MARTA CARDS: 216 rail and 500 bus cards.

While free outlets for advertising such as water bill inserts and the MARTA Rider's Digest will be used, media will be purchased as well.

SCHOOLS AND CURRICULUM

Fragments of the subject of solid waste management are contained in the present science curriculum used in the Atlanta Public Schools, but current teacher training does not incorporate the fragments into a the single subject of waste management. Teachers responsible for presenting the science curriculum are not shown that the material demonstrably relates to solid waste education.

The ideal amalgam of this subject with other subjects, or how environmental and waste management education can incorporate other subjects and the student's personal experience, is approached in the KAB Curriculum "Waste In Place" for grades K-8, endorsed by the State Department of Education. The City and the ACCC presented this curriculum to seventeen teachers working in schools contained in the recycling program areas in 1992, and sixty-two teachers in three seminars as of May, 1993. The workshops will continue to be presented in areas where waste reduction and recycling programs come on line in the future. The focus is presently on all third grade teachers and, once that goal is reached, will expand to middle and upper schools and utilize the secondary curriculum, "Waste: A Hidden Resource, for grades 8-12.

Teachers responsible for the pilot environmental studies program at Oglethorpe Elementary School will participate in "Waste In Place" workshops in 1993. Their environmental studies program is sponsored by the Atlanta Board of Education, in conjunction with the Energy and Environmental Science Program of Clark Atlanta University with a grant from the U.S. Department of Energy. The pilot studies program includes sections on surface, ground and drinking water, household hazardous waste, recycling, composting, landfills, and air quality. The teachers are taught these subjects in order to act in a supplemental or support role, but the program is currently presented after school. Starting its second year in the fall of 1992, the program grew to include more subjects and cover more weeks of instruction, 20 at present. The goal of the program is to match this after-school program with the in-school curriculum, subject for subject, through teacher training. ACCC and the Bureau of Sanitary Services, with the help of Browning-Ferris Industries, presented a recycling workshop to program participants on Earth Day, 1993.

City staff works with elementary schools on recycling, and has provided the U.S. Environmental Protection Agency curriculum, titled "Let's Reduce and Recycle: Curriculum for Solid Waste Awareness," to many schools. Classroom aids such as videos, posters, workbooks and pamphlets on recycling are supplied as well.

Both Waste Management of North America and Browning Ferris Industries have provided their curricula to schools to be used as supplemental material by individual teachers. A list of all materials referred to in this section is shown in the addenda to this element.

A number of Atlanta public schools are providing environmental education on an extracurricular basis. In their Environmental Action Gives Life to Earth (EAGLE) program which began in 1988, Warren Jackson Elementary School parents volunteer to teach environmental education in the classroom for half an hour every other week. The program concentrates on the cycles of nature and includes sections on the food chain and air and water quality as well as solid waste management and disposal. The school has a drop-off newspaper recycling bin, holds a monthly recycling drive, and has a demonstration composting program to support their classroom efforts. The weekly school bulletin for students and parents includes an environmental suggestion, known as an Eagle Hint. The program is self directed; parents do their own research, design presentations, and coordinate their programs with individual classroom teachers.

Morningside Elementary School directs special attention to recycling during Earth Week and participates in an annual aluminum foil recycling program. E. Rivers Elementary School has incorporated a recycling section into their social studies program, including creative writing and art projects on the subject. E. Rivers has a volunteer recycling coordinator who is a PTA member. Their on-site drop-off recycling program supports classroom efforts.

The Global Thinking Project at Georgia State University is a program which brings students in Georgia in touch with their peers in other countries of the world by means of new technologies and new science education teaching materials. A telecommunications network links public and private schools in Georgia with schools on other continents in order to study ecological problem solving. Inman Middle School will participate in this project. Solid waste education is a one of the fields of study, as are water pollution, ozone, and a river watch project on environmental monitoring.

All fourth graders in the Atlanta Public Schools received a special newsletter on recycling during the 1990, 1991 and 1992 school years. This material was part of the National Audubon Society's "AUDUBON ADVENTURES," an environmental education program for grades three through six which was made available in Atlanta schools by an anonymous donor.

Solid waste education most often shares space in the curriculum with water quality, air quality, and other environmental subjects, yet none of these efforts receive support or funding from either the local school system or from the state, outside of the KAB program. As a result, the quality of solid waste education necessarily varies widely from school to school and undoubtedly also from jurisdiction to jurisdiction; it is questionable whether a governing body can uniformly impact what are essentially internal volunteer projects. Without the establishment of state standards on solid waste education, this situation will continue. The City of Atlanta will of course continue to support KAB curriculum projects and instructional and educational efforts in its program areas as its reduction programs are expanded, and hopes for a greater commitment from the state and the schools in the near future.

FUNDING

The City of Atlanta committed more than \$2.00 per participant household to the curbside recycling expansion in 1993, and has continued to support educational efforts in the area of solid waste reduction. In addition to City programs, the recycling vendor contract contains a requirement to produce and mail a biannual newsletter on program progress in the spring and fall of each year. The vendor continues to participate in in-school programs and neighborhood meetings, and provides its Mobius character and a recycling truck at demonstrations.

Future educational programs will benefit from the availability of State grants, upon acceptance of the Solid Waste Plan, and the Solid Waste Trust Fund can be tapped as a source of funding as well.

EDUCATIONAL MATERIALS

The City of Atlanta has taken advantage of free resources available in order to respond to the hundreds of requests for information on solid waste programs and issues it receives each year. A resource list of the most widely used items is included at the end of this element.

In addition, instructions on what, how and why to recycle were developed and distributed in the form of a brochure and bin sticker to all participants in the curbside recycling program. Three newsletters and two announcement letters were developed in conjunction with this program, and an annual report was distributed at the end of the first year. The City also researched and wrote the canvass questionnaires and developed instruction sheets generic to each canvass area.

Atlanta Clean City Commission Program and Promotional Materials

Brochures

- "Atlanta's Picking Up"
- "Guide to a Cleaner, Safer Atlanta"
- "Seven Steps to an Office Recycling Program" (includes video)
- "It's Only Yard Waste If You Throw It Away"
- "Starting At Home--Recycling to Protect the Environment"
- "ACCTION" (bi-monthly newsletter)

Fliers/Leaflets

- How to Conduct a Neighborhood Cleanup
- Christmas Tree Recycling
- Telephone Book Recycling

Miscellaneous

- Utility Bill Inserts
- Litter Bags
- Litter Critter Mascot

Workshop Materials

- Waste In Place (curriculum guide for K-7 teachers)
- Waste: A Hidden Resource (curriculum guide for 7-12 teachers)
- Waste in the Workplace (guide for environmental business practices)

Waste-In-Place Curriculum

Grades K-6

"Earth-The Apple of Our Eye"

- Discusses the importance of the earth and how it needs to be protected.

"Trash Trivia"

Goals and Objectives

Overview of solid waste disposal alternatives

- Reduce, reuse, recycle, compost, landfill.

"What's In My Trashcan?"

- Activity addressing where waste is generated."

"Garbage Pizza"

- Participants make a pit chart "pizza" of the solid waste stream.

"180 Million Tons of Trash"

- Discussion of integrated solid waste management (poster).

"Keep It Beautiful"

- Discussion of composting.

"When They're Gone, They're Gone"

- Activity dealing with renewable and nonrenewable resources.

"Plastics By The Numbers"

- Activity identifying the categories of plastic containers.

Activity Centers

- "Metal Melts"
- "Recycling Plastics"
- "Making Paper"
- "Litter Value"
- "Paper Trees"

Questions and Answers

Wrap Up and Evaluation

ELEMENT SEVEN IMPLEMENTATION AND FINANCING

The goal of this planning element is:

"To develop a balanced, affordable solid waste management plan implementation strategy which supports the goals and meets the requirements of the Georgia Comprehensive Solid Waste Management Act."

REQUIRED CAPITAL AND OPERATIONAL COST

Collection Cost

The City of Atlanta will continue to operate its fleet of collection vehicles to serve the residential waste collection needs of the city. This cost is expected to be comparable in cost to previous years. The amount of \$19.15 million is required to fund residential waste collection in 1995. This amount is expected to increase approximately 3% per year over the planning period.

Separate collection of yard trimmings will be undertaken by the city. The City will need an initial capital outlay in the first year (1995) of its yard trimmings collection program of approximately \$0.455 million to purchase trucks and equipment for collection and transport of yard trimmings. Annual operations costs are shown in table 7-1.

Collection of commercial waste is expected to be handled by private waste haulers who have been willing and able to handle that task in the past and show every indication of willingness and ability to continue that service into the future. The City spends no public funds in the private collection of commercial waste.

Waste Disposal Reduction Programs

The city-wide single family curbside recycling program is budgeted at \$2.5 million during 1994. This figure is expected to increase by approximately 3% yearly. During its first nine months of operations, the program diverted disposal of 7,335 tons of discards that were destined to be landfilled.

The Solid Waste Information Program has been implemented as a component of the city wide curbside recycling program and will continue as a part of that program.

Processing the collected yard trimmings for the compost program will require capital investments of \$1.113 million for equipment during its first year of operation (1995). Process operations estimates are shown in table 7-1. The yard trimmings compost processing facility is expected to be established at existing landfill sites or at other sites if permitting restrictions make use of the landfill sites too difficult. Use of existing sites is preferred so that purchase of new land will not be required.

Sewage sludge waste reduction/reuse will continue. Construction of sludge dryers/incinerators are planned. Any new facilities would be funded through the budget of the Bureau of Pollution Control.

Disposal Cost

The city will continue private disposal of waste at the Waste Management Live Oaks landfill or other private disposal facilities until the new disposal facility is operational. The costs of disposal under the present contract is \$14.49 per ton. This cost is expected to increase or decrease along with the Consumer Price Index (CPI) over the ten year planning period. Estimates are shown in Table 7-1.

Closure & Post Closure of Existing Facilities

State and federal regulations require the proper closure and post closure maintenance of landfills. The closure cost are estimated as shown in Table 7-1. The closure cost estimates are based on present proposals, site acreage, estimated number of monitoring wells and required monitoring.

Replacement Landfill

The City estimates it will take a minimum 2 1/2 years for development through construction of new disposal facilities. During this interim period, disposal capacity will continue through private sources.

The city will seek a permit for construction of a new disposal facility. This facility will have those qualities necessary all federal, state, and local guidelines.

Preliminary estimates are that a new landfill should cost about \$300,000 per acre to develop, install the maintenance facilities, and construct the first lined disposal area. If the facility is financed long term, the cost of development, construction, operation, monitoring, closure, and post closure should be approximately the same as that of private landfill disposal. Costs estimates associated with new landfill development are also shown in table 7-1.

Methods of Financing

At present, the programs presented in this document will primarily be funded by service charges or General Obligation bonds. Landfill closures will be funded using general obligation bonds. All other waste management services will be paid from the General Fund with funds generated through service charges. Any changes in the methods of financing for solid waste programs brought on by actions of the Mayor and/or Council shall be incorporated in the plan by reference at the time of enactment.

There are a variety of sources to cover the costs of a solid waste management system. Revenues can be from the following sources including:

General Funds

The funds for financing of solid waste are collected in the local government's general fund. The general fund revenues are collected in the general property tax.

User Fees

User fees charge the amount of money to reflect the total amount of revenue spent to provide the service. User fees distribute the cost of providing solid waste management among users on a proportional basis.

Local Option Sales Tax

This sales and use tax is a joint county and municipality venture, levied at the rate of one percent. All counties may participate, but municipalities must qualify in order to impose the tax.

Special Purpose Tax

Georgia law authorized a special purpose tax in 1985, this enables counties to raise funds to finance a single purpose facility. Maximum duration is five years for the tax.

General Obligation Bonds

The issuing municipality guarantees general obligation bonds with its credit based on its ability to levy taxable real property in order to pay the principal and interest on the bonds. The authorization to issue these bonds requires a referendum. The bonds can be paid for with user fees.

Revenue Bonds

Revenue bonds guarantee the payment by pledging the net revenue from the project. Revenue bonds require technical and economic analysis of the project to be financed.

Current Revenue Capital Financing

This method is generated by surplus capital. It is typically used to finance collection vehicles and landfill disposal systems.

Implementation

A schedule for implementing each element of the plan is developed and shown on the following table. The items in the table are activities the City is presently providing or will implement in cooperation with other government agencies.

IMPLEMENTATION SCHEDULE			
Element	Year	Cost	Funding Source
Curbside Recycling (up to four units)	ONGOING	\$2,500,000	General Fund
Multi-Family Recycling	1997	\$1,180,000	General Fund
Commercial Waste Reduction	1995 - 2002	NA.	
Yard Trimming Collection and Processing	1995	\$2,970,890	General Fund
Residential/Commercial Waste Information Program	ONGOING	Included in Curbside Program	General Fund
Volume Based Collection Program	1996	\$5,500,000	General Fund
Landfill Closures	1995	\$25,000,000	General Obligation Bonds
New Disposal facility	1996	\$3,000,000	General Fund
TOTAL		\$33,500,000	

Note: Costs are shown for year of implementation. See Table 7-1 and 7-2 for five and ten year costs estimates

Updating the Plan

Formal procedures will be established for revisiting the plan due to changed circumstances. Each year in January the plan will be reviewed for what will be accomplished in that calendar year. Identification of problem areas will be addressed. Any plan revisions will be evaluated during this review. An annual report will detail the past year's accomplishments and difficulties. This annual report will be issued to the City Council.

After 5 years, the entire plan will be revisited and possibly be rewritten or updated. With interim plan revisions under the Comprehensive Development Plan annual update, it will be easier to update the plan after 5 years. Any substantive modifications to the plan would be incorporated into the Comprehensive Development Plan (CDP) during the next CDP update.

Ordinances Required

In order to carry out the recommended plan, several legal mechanisms must be modified or created. Some of the legal mechanisms can be established through ordinances. The following ordinances will require attention:

1. Zoning Ordinance

The overall intent of zoning ordinance modifications is to provide greater clarity to where different solid waste management facilities can locate within the City. Under existing zoning regulations, several types of recycling and solid waste handling facilities are not addressed. In the interest and convenience for residences the City may want to locate a recycling facility (i.e. drop off, buy back centers) in residential neighborhoods and restrict other solid waste facilities to heavy commercial and industrial areas. Upon approval of this plan, the Bureau of Planning will review the existing zoning ordinances to look at and identify zone text amendments that would clarify allowable locations for solid waste and recycling handling facilities.

2. Yard Trimmings Ordinance

The plan specifies that yard trimmings will be collected separately and may not be mixed with waste set out for collection. An ordinance may be required to prohibit commingling of yard trimmings and ordinary garbage that is set out for collection.

3. Volume Based Rates Ordinance

Volume-based rates give individuals (commercial and residential) a monetary incentive to reduce waste. It also encourages participation in composting and recycling programs. A volume-based rate ordinance could be established that would not require all citizens to participate, but would require it to be offered to all citizens. A volume based rate ordinance would establish the rates and methods of payment for trash removal.

4. Reporting Requirement

This ordinance is recommended as a part of the plan. It requires all collectors of waste operating within the city limits, to report tonnage collected within the city and provide yearly assurance of disposal capacity. This reporting requirement is essential if the city is to fulfill the requirements under state solid waste law, O.C.G.A. 12-8-31.1. This ordinance is prepared to be in force in 1995.

Staffing

Implementing the plan will require adequate staff for the planned programs. As programs are developed and implemented, additional staffing will be required. The level of staffing will be determined by whether the program will be operated in-house or through a private contractor.

Full Cost Reporting

The new state law requires the development of "...effective January 1, 1992 each city and county shall be required to report to the Department of Community Affairs the total annual cost of providing solid waste management service and to disclose this information to the public. The Department of Community Affairs shall develop the forms, rules, and procedures necessary for cities and counties to meet the requirement...". Some examples of solid waste management system costs would be:

- Collection Costs
- Transfer and Hauling Costs
- Processing Costs
- Marketing/Disposal Costs
- Administrative Costs
- Educational Costs
- Capital Costs

The City has accounting measures in place that will allow full cost accounting associated with solid waste management.

TABLE 7-1 FIVE YEAR WORK PLAN

PROGRAMS	1995			1996			1997		
	Capital Cost	Operations	Annual Total	Capital Cost	Operations	Annual Total	Capital Cost	Operations	Annual Total
ADMINISTRATIVE COSTS	\$150,000	\$1,750,000	\$1,900,000	\$150,000	\$1,802,500	\$1,952,500	\$150,000	\$1,856,575	\$2,006,575
COLLECTION PROGRAMS									
Residential Waste Collection	\$2,250,000	\$16,900,000	\$19,150,000	\$2,250,000	\$17,407,000	\$19,657,000	\$2,250,000	\$17,929,210	\$20,179,210
Yard Waste Collection	\$455,000	\$1,050,890	\$1,505,890	\$455,000	\$1,082,417	\$1,537,417	\$455,000	\$1,114,889	\$1,569,889
Bulk Collection	\$2,088,480	\$1,455,748	\$3,544,228	\$417,696	\$1,499,418	\$1,917,114	\$417,696	\$1,544,401	\$1,962,097
Right of Way and Vacant Lot Maint.	\$218,000	\$2,305,000	\$2,523,000	\$218,000	\$2,374,150	\$2,592,150	\$218,000	\$2,445,375	\$2,663,375
WASTE REDUCTION PROGRAMS									
Yard Waste Compost Processing	\$1,113,000	\$352,000	\$1,465,000	\$371,000	\$362,560	\$733,560	\$371,000	\$373,437	\$744,437
Curbside Recycling (includes Solid Waste Information program)	\$0	\$2,500,000	\$2,500,000	\$0	\$2,575,000	\$2,575,000	\$0	\$2,652,250	\$2,652,250
Volume Based Collection Program	\$0	\$0	\$0	\$5,000,000	\$500,000	\$5,500,000	\$1,000,000	\$515,000	\$1,515,000
multi-family recycling program	\$0	\$0	\$0	\$0	\$0	\$0	\$1,000,000	\$180,000	\$1,180,000
DISPOSAL									
Contracted Private Disposal		\$3,410,000	\$3,410,000		\$3,512,300	\$3,512,300		\$3,617,669	\$3,617,669
Landfill Closures	\$25,000,000		\$25,000,000			\$0			\$0
Landfill Operations, Monitoring, and Post closure	\$50,000	\$2,118,000	\$2,168,000	\$20,000	\$950,020	\$970,020	\$20,000	\$978,521	\$998,521
New Disposal Facility	\$0		\$0	\$0		\$0	\$0		\$0
TOTAL	\$31,324,480	\$31,841,636	\$63,166,116	\$8,881,696	\$32,065,365	\$40,947,061	\$5,881,696	\$33,207,326	\$39,089,022

PROGRAMS	1998			1999			FIVE YEAR PLAN		
	Capital Cost	Operations	Annual Total	Capital Cost	Operations	Annual Total	Capital Cost	Operations	TOTAL
ADMINISTRATIVE COSTS	\$150,000	\$1,912,272	\$2,062,272	\$150,000	\$1,969,640	\$2,119,640	\$750,000	\$9,290,988	\$10,040,988
COLLECTION PROGRAMS									
Residential Waste Collection	\$2,250,000	\$18,467,086	\$20,717,086	\$2,250,000	\$19,021,099	\$21,271,099	\$11,250,000	\$89,724,395	\$100,974,395
Yard Waste Collection	\$455,000	\$1,148,336	\$1,603,336	\$455,000	\$1,182,786	\$1,637,786	\$2,275,000	\$5,579,318	\$7,854,318
Bulk Collection	\$417,696	\$1,590,733	\$2,008,429	\$417,696	\$1,638,455	\$2,056,151	\$3,759,264	\$7,728,753	\$11,488,017
Right of Way and Vacant Lot Maint.	\$218,000	\$2,518,736	\$2,736,736	\$218,000	\$2,594,298	\$2,812,298	\$1,090,000	\$12,237,558	\$13,327,558
WASTE REDUCTION PROGRAMS									
Yard Waste Compost Processing	\$371,000	\$384,640	\$755,640	\$371,000	\$396,179	\$767,179	\$2,597,000	\$1,868,816	\$4,465,816
Curbside Recycling (includes Solid Waste Information program)	\$0	\$2,731,818	\$2,731,818		\$2,813,772	\$2,813,772	\$0	\$13,272,840	\$13,272,840
Volume Based Collection Program	\$1,000,000	\$530,450	\$1,530,450	\$1,000,000	\$546,364	\$1,546,364	\$8,000,000	\$2,091,814	\$10,091,814
multi-family recycling program	\$200,000	\$185,400	\$385,400	\$200,000	\$190,962	\$390,962	\$1,400,000	\$556,362	\$1,956,362
DISPOSAL									
Contracted Private Disposal		\$3,726,199	\$3,726,199		\$3,837,985	\$3,837,985	\$0	\$18,104,153	\$18,104,153
Landfill Closures			\$0			\$0			\$25,000,000
Landfill Operations, Monitoring, and Post closure	\$20,000	\$1,007,876	\$1,027,876	\$20,000	\$1,038,113	\$1,058,113	\$130,000	\$6,092,529	\$6,222,529
New Disposal Facility	\$3,000,000		\$3,000,000	\$4,000,000	\$0	\$4,000,000	\$7,000,000	\$0	\$7,000,000
TOTAL	\$8,081,696	\$34,203,546	\$42,285,242	\$9,081,696	\$35,229,652	\$44,311,349	\$38,251,264	\$166,547,526	\$229,798,789

TABLE 7-2 TEN YEAR WORK PLAN

PROGRAMS	2000			2001			2002		
	Capital Cost	Operations	Annual Total	Capital Cost	Operations	Annual Total	Capital Cost	Operations	Annual Total
ADMINISTRATIVE COSTS	\$150,000	\$2,028,730	\$2,178,730	\$150,000	\$2,089,592	\$2,239,592	\$150,000	\$2,152,279	\$2,302,279
COLLECTION PROGRAMS									
Residential Waste Collection	\$2,250,000	\$19,591,732	\$20,717,086	\$2,250,000	\$20,179,484	\$22,429,484	\$2,250,000	\$20,784,868	\$23,034,868
Yard Waste Collection	\$455,000	\$1,218,270	\$1,673,270	\$455,000	\$1,254,818	\$1,709,818	\$455,000	\$1,292,462	\$1,747,462
Bulk Collection	\$417,696	\$1,687,609	\$2,105,305	\$417,696	\$1,738,237	\$2,155,933	\$417,696	\$1,790,384	\$2,208,080
Right of Way and Vacant Lot Maint.	\$218,000	\$2,672,127	\$2,890,127	\$218,000	\$2,752,291	\$2,970,291	\$218,000	\$2,834,859	\$3,052,859
WASTE REDUCTION PROGRAMS									
Yard Waste Compost Processing	\$371,000	\$408,064	\$779,064	\$371,000	\$420,306	\$791,306	\$371,000	\$432,916	\$803,916
Curbside Recycling (includes Solid Waste Information program)	\$0	\$2,898,185	\$2,898,185		\$2,985,131	\$2,985,131	\$0	\$3,074,685	\$3,074,685
Volume Based Collection Program	\$1,000,000	\$562,754	\$1,530,450	\$1,000,000	\$546,364	\$1,546,364	\$1,000,000	\$562,755	\$1,562,755
multi-family recycling program	\$200,000	\$196,691	\$385,400	\$200,000	\$190,962	\$390,962	\$1,000,000	\$180,000	\$1,180,000
DISPOSAL									
Contracted Private Disposal		\$0	\$0		\$0	\$0		\$0	\$7,848,243
Landfill Closures			\$0			\$0			\$0
Landfill Operations, Monitoring, and Post closure	\$20,000	\$1,069,256	\$1,089,256	\$20,000	\$1,101,334	\$1,121,334	\$20,000	\$1,134,374	\$1,154,374
New Disposal Facility	\$2,500,000	\$3,953,125	\$6,453,125	\$2,500,000	\$4,071,718	\$6,571,718	\$2,500,000	\$4,193,870	\$6,693,870
TOTAL	\$7,581,696	\$36,286,542	\$42,699,997	\$7,581,696	\$37,330,235	\$44,911,931	\$8,381,696	\$38,433,452	\$54,663,391

PROGRAMS	2003			2004			TEN YEAR PLAN		
	Capital Cost	Operations	Annual Total	Capital Cost	Operations	Annual Total	Capital Cost	Operations	TOTAL
ADMINISTRATIVE COSTS	\$150,000	\$2,216,848	\$2,366,848	\$150,000	\$2,283,353	\$2,433,353	\$1,500,000	\$20,061,789	\$21,561,789
COLLECTION PROGRAMS									
Residential Waste Collection	\$2,250,000	\$21,408,414	\$20,717,086	\$2,250,000	\$22,050,667	\$24,300,667	\$22,500,000	\$193,739,560	\$212,173,586
Yard Waste Collection	\$455,000	\$1,331,236	\$1,786,236	\$455,000	\$1,371,173	\$1,826,173	\$4,550,000	\$12,047,276	\$16,597,276
Bulk Collection	\$417,696	\$1,844,095	\$2,261,791	\$417,696	\$1,899,418	\$2,317,114	\$5,847,744	\$16,688,496	\$22,536,240
Right of Way and Vacant Lot Maint.	\$218,000	\$2,919,905	\$3,137,905	\$218,000	\$3,007,502	\$3,225,502	\$2,180,000	\$26,424,242	\$28,604,242
WASTE REDUCTION PROGRAMS									
Yard Waste Compost Processing	\$371,000	\$445,903	\$816,903	\$371,000	\$459,280	\$830,280	\$4,452,000	\$4,035,286	\$8,487,286
Curbside Recycling (includes Solid Waste Information program)	\$0	\$3,166,925	\$3,166,925		\$3,261,933	\$3,261,933	\$0	\$28,659,698	\$28,659,698
Volume Based Collection Program	\$1,000,000	\$530,450	\$1,530,450	\$1,000,000	\$546,364	\$1,546,364	\$13,000,000	\$4,840,501	\$17,808,197
multi-family recycling program	\$200,000	\$185,400	\$385,400	\$200,000	\$190,962	\$390,962	\$3,200,000	\$1,500,377	\$4,689,086
DISPOSAL									
Contracted Private Disposal		\$0	\$0		\$0	\$0	\$0	\$18,104,153	\$25,952,397
Landfill Closures			\$0			\$0			\$25,000,000
Landfill Operations, Monitoring, and Post closure	\$20,000	\$1,168,405	\$1,188,405	\$20,000	\$1,203,457	\$1,223,457	\$230,000	\$11,769,354	\$11,999,354
New Disposal Facility	\$2,500,000	\$4,319,686	\$6,819,686	\$2,500,000	\$4,449,277	\$6,949,277	\$19,500,000	\$20,987,675	\$40,487,675
TOTAL	\$7,581,696	\$39,537,268	\$44,177,635	\$7,581,696	\$40,723,386	\$48,305,082	\$76,959,744	\$358,858,408	\$464,556,826

* These totals include the totals from Table 7-1 Five Year Work Plan

APPENDIX A

APPENDIX A ATLANTA'S SOLID WASTE CHARACTERIZATION

INTRODUCTION

Solid waste characterization consists of determining the quantity of waste available for disposal, the composition of the waste, and the sources of the waste. As environmental laws become more restrictive and as waste management techniques other than landfills are being considered, it becomes ever more important to determine not only the quantity of waste, but also its composition. Knowing the composition, decisions can be made concerning the feasibility for recovering and marketing recyclables or for converting a portion of the waste stream to energy. The analysis described below of residential waste generated in Atlanta has shown that there are some important differences between Atlanta averages and national averages. The per capita generation rate in Atlanta is considerably higher than the national average, and there appears to be some differences in composition as well.

The quantity of municipal solid waste (residential plus commercial) generated in the entire Atlanta metropolitan region has been estimated by the Atlanta Regional Commission. The estimated 1990 generation rate was 7.9 pounds per capita per day (pcd), with 45 percent being residential waste and 55 percent commercial(1). This is considerably higher than the 1990 national average of 4.3 pcd(2), of which an estimated 60 percent is from residential sources. The ARC estimate for construction/demolition waste is 1.77 pcd, compared to 1.37 pcd nationally.

Based on the City of Atlanta's landfill records, disposal of waste from Atlanta residential sources totaled 3.95 pcd in 1990 and 3.61 pcd in FY 1992. Total waste disposal from the City of Atlanta in 1990 was 11.9 pcd, including residential, commercial, and industrial waste, construction/demolition materials, sludge, street sweepings, and trees and brush. These rates were calculated using Atlanta Regional Commission population estimates (3).

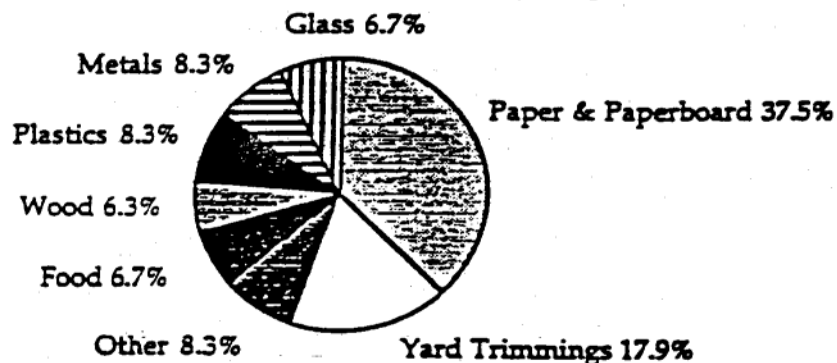
There may be several reasons that the generation rate in Atlanta is higher than the national average. First, Atlanta is a large metropolitan area, and generation, particularly of commercial waste is normally higher in urban areas. Second, Atlanta has nearly a year round growing season, which should result in more than average yard waste. Another reason Atlanta generation rates may be higher than average is that total employment in Atlanta(4) is almost equal to the population, compared to 42 percent of population on a national basis. This high per capita employment is a result of many residents of neighboring communities commuting to Atlanta to work. The work that these people perform generates waste, but the individuals are not counted as residents. This results in a higher than average commercial waste generation rate, on a per capita basis.

The purpose of this analysis is to determine as accurately as possible within the time and cost constraints of the project, the composition of Atlanta's waste stream. The City collects residential waste with its own crews. Therefore, the initial emphasis is on determining the composition of residential waste. However, estimates of total quantity and composition are also important. Unfortunately there is no dependable, easily available measure of waste generated in the city but collected and disposed by private enterprise. The non-residential waste fraction is estimated to make up about 2/3 of the waste generated in the city.

CHARACTERIZATION PROCEDURES

There have been several studies of municipal solid waste (MSW) generation and its composition published in the United States in the last 20 years. In 1990, U.S. generation of municipal solid waste totaled 195.7 million tons or 4.3 pound per person per day. Figure 1 provides a percentage breakdown by weight of the materials generated in MSW in 1990 (2)

Figure 1. Materials generated in MSW by weight, 1990



There are two basic approaches to estimating the composition of MSW. The first method utilizes a material flows approach to estimate the waste stream. This method was used to determine the national percentages illustrated in Figure 1. The material flows methodology is based on production data (by weight) for the materials and products in the waste stream. Adjustments are made for imports and exports and for diversions from MSW (e.g., for building materials made of paperboard). Adjustments are also made for the lifetimes of products. Finally, food wastes and yard trimmings and a small amount of miscellaneous inorganic wastes are accounted for by compiling data from a variety of waste sampling studies.

The second approach to characterizing MSW, which is site-specific, involves sampling, sorting, and weighing the individual components of the

waste stream. This method can be useful in defining a local waste stream. Sampling and hand sorting were used to determine the composition of waste specific to Atlanta.

Waste sampling methodology varies depending on the level of accuracy desired. Accuracy depends on the number of samples sorted and the specific techniques used to separate the waste components. Though distinctive in application, the techniques vary with the components involved in the characterization. The more identifiable items or sort categories, the more defined the task and the higher the accuracy achieved for the samples selected to be sorted. On the other hand, the more representative samples that are sorted, the closer the measured average composition is to the true average for the City.

Based on previous experience and the City of Atlanta's specific budgetary constraints, characterization parameters were selected. A specific waste characterization process was outlined, based on the Michigan Solid Waste Stream Assessment Guidebook(5) and modified specifically for the City of Atlanta. The number of samples and waste sample size were determined based on previous experience in sorting waste. Ninety five percent confidence intervals for the average component percentages were statistically determined.

Waste stream components or categories were selected based on market availability. The number of sorts reflected the number of truck loads going to city landfills from different areas of the city. The methodology of hand sorting was implemented as dictated from past experience and then modified as necessary. The waste stream components for the City of Atlanta are:

FOOD WASTE
OTHER PAPER
POLYSTYRENE FOAM
PET BOTTLES
TEXTILES
LEATHER
WOOD
OTHER GLASS
BI-METAL
NON-FERROUS
OTHER
DIAPERS

NEWSPAPER
CARDBOARD
NATURAL HDPE BOTTLES
OTHER PLASTICS
RUBBER
YARD WASTES
GLASS BOTTLES & JARS
ALUMINUM BEVERAGE CANS
TIN FOOD CANS
FERROUS
DIRT/ASH BRICKS

The following modifications to the sort categories were made; Leather, Rubber, and Textile were combined, and Ferrous, and Non-ferrous were categorized as Other Metals.

A knowledge of the waste composition is critical for the development of Atlanta's Solid Waste Plan. The sort values will be used in many aspects of the Plan and will assist in the justification and selection process of the Plan. Specifically, they will be used to determine the level of recycling the City can expect to achieve, the value of the recovered materials, the potential for reduction or reuse, the sizing of facilities, and the thermal value of the waste stream.

A specific number of sorts spread over four seasons improves the accuracy of the average annual composition determined, and also provides information on the seasonal variations. Each season contains specific variations to certain category quantities.

The sorting process was performed by the City. Fichtner conducted a one day training session in waste characterization using waste collected by the city. This served as a "dry run" for the characterization project. The work of separating and weighing the components of waste was conducted by city personnel. The city personnel working on the project had no prior experience in performing this task, but were agreeable toward the somewhat distasteful work of waste characterization. The city was also responsible for compiling the data gathered. Personnel from Fichtner "looked in" on the work about every other day during the Fall sampling period. Subsequent sampling events were conducted almost entirely by city forces on their own.

ATLANTA RESIDENTIAL WASTE

Two methods were used to estimate the average composition of residential solid waste available for recovery or disposal in Atlanta. In the first method, waste disposed from the households was sampled and sorted in each of the four seasons. City crews selected representative truck loads of waste, and sorted 100 to 900 pound samples from the loads into component parts.

In the second method, national generation data developed by FAL for the USEPA by the material flows method were adjusted to allow a direct comparison with the sampling results. Adjustments were necessary because there is no national database that lists the average composition of waste as discarded from residences. Material flows data are developed for as-generated residential plus commercial waste, before recycling and before being mixed with other components in a packer truck, where moisture transfer takes place.

The following adjustments are necessary to compare national gross MSW generation data to Atlanta's "as sampled" data.

- Combine (or separate) appropriate EPA categories to agree with the categories chosen for the sampling study

- Subtract the materials not sampled, such as the materials that make up appliances, furniture and furnishings, tires, and batteries
- Estimate on a component by component basis the percent of MSW that is generated in residences as opposed to commercial establishments
- Subtract the materials recycled from Atlanta residences since sampling was done at the "disposal" site (after material recovery for recycling).
- Correct for moisture transfer, i.e. moisture that transfers in the packer trucks from the wet food and yard wastes to the dry components, particularly paper products

After these corrections, the national data can be compared directly with the data as sampled by Atlanta's sorting crews. The 4-season sampling was completed in the summer of 1992.

Neither of the two methods discussed above (sorting Atlanta's waste and using national averages) is without potential errors for determining the average composition of waste generated in Atlanta. Potential errors in the first method arise from the following:

- Only a limited number of samples can be sorted each season
- A small portion of each of the seasons is represented (maximum of three weeks per season)
- Mixed fine materials (and composite products) introduce sorting uncertainties
- The method assumes the sampling periods are "average" with respect to rainfall, economic conditions, etc. For example, sampling during a wet spell or during a brief recession may cause the results to be misinterpreted
- Selected sampling periods usually avoid unusual generation times, such as holidays, spring cleanup, conventions, etc., which should somehow be factored into the annual average composition

- Large bulky items, such as appliances, mattresses, bicycles, furniture, etc., are difficult to sample and are therefore usually excluded from the sampling study

The second method also has some obvious potential errors, such as:

- Assumes Atlanta is an "average" community with respect to per capita generation
- Assumes each year in Atlanta is "average," with respect to weather, economic conditions, etc.
- Seasonal variations in composition are averaged out, whereas the sampling method may detect real seasonal variations

A combination of the two methods can be used to determine if the Atlanta waste stream is unique. The following analysis compares the results obtained by the two methods described above.

Sampling Results

In the three week period from October 21 to November 8, 1991, a total of 62 samples of residential waste averaging 584 pounds each were sorted into their component parts. The trucks for the sorting were selected at random. Between January 27 and February 14, 1992, a total of 74 samples averaging 484 pounds each were sorted. Seventy five samples averaging 464 pounds were taken between April 20 and May 8, 1992. The summer sampling period, July 13 to July 30, 1992, averaged 517 pounds per sample. Attachment 1 shows the sampling data.

Table 1 summarizes the results of the four sorts. These data represent the composition of Atlanta residential waste disposed, as determined by the four 1991 - 1992 sampling periods. In addition to the average percentage of each component, Table 1 also shows the maximum, minimum and median percentages of each component. These data show that, as expected, there is a considerable variation in composition from sample to sample. (After all, it is "trash".) This variation explains the need for sampling a large number of representative loads of waste. For example, there were some samples that contained only yard waste, while others contained none.

A further statistical analysis of the sampling results is shown in Table 2. The standard deviation and 95 percent confidence intervals of the means (averages) were calculated. An example can be used to explain the significance of the data in Table 2. Providing that representative trucks were sampled, we can say with a 95 percent confidence that the true mean

Table 1
ANALYSIS OF ATLANTA SAMPLING RESULTS 1991-92
(Residential waste only)

	FALL SAMPLING (62 Samples)				WINTER SAMPLING (74 Samples)			
	Average Fall	Maximum Percent	Minimum Percent	Median Percent	Average Winter	Maximum Percent	Minimum Percent	Median Percent
Newspaper	5.1	11.9	0.0	5.3	7.1	27.4	0.0	6.6
Cardboard	5.1	16.0	0.0	5.1	5.1	21.2	0.0	3.6
Other paper	13.2	32.7	0.0	14.0	23.0	57.1	0.0	23.3
Total paper	23.5				35.2			
HDPE	0.49	2.3	0.0	0.40	0.82	2.8	0.0	0.80
PET	0.42	1.5	0.0	0.12	0.84	6.3	0.0	0.52
Polystyrene foam	0.77	2.9	0.0	0.68	0.98	5.6	0.0	0.81
Other plastic	6.15	17.0	0.0	6.37	8.26	14.0	0.0	6.60
Total plastic	7.8				10.9			
Yard Waste	27.1	92.6	0.0	25.3	19.0	100.0	0.0	11.6
Wood Waste	4.0	42.9	0.0	2.2	2.9	19.6	0.0	0.6
Food Waste	3.7	22.4	0.0	3.6	5.6	18.2	0.0	6.2
Diapers	3.0	12.6	0.0	2.2	3.7	12.9	0.0	3.5
Tex/Rub/Leather	6.7	44.9	0.0	5.6	6.4	32.9	0.0	5.0
Total Organics	77.8				83.8			
Aluminum	0.83	2.8	0.0	0.85	1.0	3.4	0.0	1.0
Tin	1.83	4.8	0.0	1.77	2.3	6.0	0.0	2.2
Bimetal	0.21	2.8	0.0	0.00	1.1	10.3	0.0	0.2
Other Metals 1/	2.04	28.0	0.0	0.00	1.1	12.1	0.0	0.0
Glass bottles	5.48	19.4	0.0	4.79	6.6	24.1	0.0	6.1
Other glass	0.63	21.2	0.0	0.00	0.4	3.9	0.0	0.0
Dirt/gravel/other 2/	11.21	36.9	0.0	9.89	3.7	27.6	0.0	3.3
Total Inorganics	22.2				16.2			
Total	100				100			

1 / Includes ferrous and nonferrous

2 / Includes some organics

Table 1 (continued)
ANALYSIS OF ATLANTA SAMPLING RESULTS 1991-92
(Residential waste only)

	SPRING SAMPLING (75 Samples)				SUMMER SAMPLING (58 Samples)			
	Average Spring	Maximum Percent	Minimum Percent	Median Percent	Average Summer	Maximum Percent	Minimum Percent	Median Percent
Newspaper	6.3	23.9	0.0	5.8	7.8	24.0	0.0	7.5
Cardboard	3.8	25.4	0.0	3.0	4.9	21.0	0.0	4.5
Other paper	16.2	46.7	0.0	16.3	13.6	31.8	0.0	14.5
Total paper	26.3				26.1			
HDPE	2.3	17.8	0.0	0.2	1.0	8.3	0.0	0.2
PET	1.0	15.8	0.0	0.0	0.8	7.7	0.0	0.0
Polystyrene foam	1.2	7.8	0.0	1.0	1.8	18.3	0.0	0.8
Other plastic	8.2	25.2	0.0	8.0	5.8	14.7	0.0	5.9
Total plastic	12.7				9.2			
Yard Waste	24.1	100.0	0.0	16.9	19.9	100.0	0.0	14.1
Wood Waste	4.4	26.2	0.0	1.9	5.7	45.0	0.0	2.8
Food Waste	4.3	14.5	0.0	4.0	6.0	26.8	0.0	5.0
Diapers	2.2	12.2	0.0	1.5	2.0	5.7	0.0	1.8
Tex/Rub/Leather	6.6	41.6	0.0	4.5	9.2	30.0	0.0	7.2
Total Organics	80.8				76.1			
Aluminum	1.1	4.5	0.0	0.9	1.5	12.3	0.0	0.9
Tin	2.6	24.2	0.0	1.4	2.0	7.4	0.0	1.9
Bimetal	0.6	13.4	0.0	0.0	0.5	6.2	0.0	0.0
Other Metals 1/	1.6	28.5	0.0	0.0	2.9	32.8	0.0	0.0
Glass bottles	4.4	20.4	0.0	4.0	7.3	23.3	0.0	6.2
Other glass	0.1	3.8	0.0	0.0	0.1	6.1	0.0	0.0
Dirt/gravel/other 2/	9.2	35.8	0.0	3.7	7.6	25.7	0.0	2.6
Total Inorganics	19.6				21.9			
Total	100				100			

1 / includes ferrous and nonferrous

2 / includes some organics

Table 2
ANALYSIS OF ATLANTA SAMPLING RESULTS 1991-92
(Residential waste only)

	FALL SAMPLING (82 Samples)				WINTER SAMPLING (74 Samples)			
	Average Percent	Std Dev	Confidence Low	Interval 3/ High	Average Percent	Std Dev	Confidence Low	Interval 3/ High
Newspaper	5.1	3.12	4.4	5.8	7.1	4.92	6.0	8.2
Cardboard	5.1	3.21	4.4	5.9	5.1	4.43	4.1	6.1
Other paper	13.2	7.82	11.4	15.0	23.0	10.9	20.5	25.5
Total paper	23.5				35.2			
HDPE	0.5	0.55	0.4	0.6	0.82	0.85	0.7	1.0
PET	0.4	0.48	0.3	0.5	0.84	1.18	0.6	1.1
Polystyrene foam	0.8	0.78	0.6	0.9	0.98	1.01	0.7	1.2
Other plastic	6.2	3.53	5.3	7.0	8.28	3.45	7.5	9.0
Total plastic	7.8				10.9			
Yard Waste	27.1	24.81	21.4	32.7	19.0	22.01	14.0	24.0
Wood Waste	4.0	7.48	2.3	5.7	2.9	4.90	1.8	4.0
Food Waste	3.7	3.47	2.9	4.5	5.8	4.09	4.9	6.7
Diapers	3.0	3.08	2.3	3.8	3.7	3.01	3.0	4.3
Tex/Rub/Leather	8.7	9.30	6.8	10.8	6.4	8.23	5.0	7.8
Total Organics	77.8				83.8			
Aluminum	0.8	0.75	0.7	1.0	1.01	0.88	0.8	1.2
Tin	1.8	1.32	1.5	2.1	2.27	1.58	1.9	2.6
Bimetal	0.2	0.57	0.1	0.3	1.13	1.78	0.7	1.5
Other Metals 1/	2.0	4.82	1.0	3.1	1.05	2.11	0.6	1.5
Glass bottles	5.5	4.72	4.4	6.6	6.62	4.32	5.6	7.8
Other glass	0.8	2.79	0.0	1.3	0.38	0.85	0.2	0.8
Dirt/gravel/other 2/	11.2	9.88	9.0	13.5	3.72	3.43	2.9	4.5
Total Inorganics	22.2				18.2			
Total	100.0				100.0			

1 / Includes ferrous and nonferrous

2 / Includes some organics

3 / 95% confidence interval for the mean = mean \pm 1.96 X SD/SQRT(N)

Table 2 (continued)
ANALYSIS OF ATLANTA SAMPLING RESULTS 1991-92
(Residential waste only)

	SPRING SAMPLING (75 Samples)				SUMMER SAMPLING (58 Samples)			
	Average Percent	Std Dev	Confidence Interval 3/ Low High		Average Percent	Std Dev	Confidence Interval 3/ Low High	
Newspaper	6.3	5.08	5.1	7.4	7.8	5.80	6.1	9.0
Cardboard	3.8	4.31	2.8	4.8	4.9	3.85	4.0	5.9
Other paper	16.2	9.89	14.0	18.4	13.8	8.05	11.5	15.7
Total paper	26.3				26.1			
LDPE	2.3	4.67	1.2	3.3	1.0	1.60	0.6	1.5
PET	1.0	2.53	0.4	1.5	0.8	1.37	0.4	1.1
Polystyrene foam	1.2	1.28	0.9	1.5	1.8	3.00	1.0	2.5
Other plastic	8.2	5.30	7.0	9.3	5.6	3.70	4.7	6.6
Total plastic	12.7				9.2			
Yard Waste	24.1	26.11	18.2	30.0	19.9	20.24	14.7	25.1
Wood Waste	4.4	6.73	2.9	6.0	5.7	8.68	3.4	7.9
Food Waste	4.3	3.77	3.4	5.1	6.0	5.52	4.6	7.5
Diapers	2.2	2.39	1.6	2.7	2.0	1.89	1.5	2.5
Tex/Rub/Leather	6.6	7.53	4.9	8.3	9.2	7.87	7.2	11.2
Total Organics	80.8				78.1			
Aluminum	1.1	0.99	0.8	1.3	1.5	1.94	0.9	2.0
Tin	2.6	4.02	1.7	3.5	2.0	1.92	1.5	2.5
Bimetal	0.6	1.97	0.1	1.0	0.5	1.54	0.1	0.9
Other Metals 1/	1.8	4.82	0.6	2.7	2.9	5.59	1.4	4.3
Glass bottles	4.4	4.05	3.5	5.3	7.3	5.41	5.9	8.7
Other glass	0.1	0.50	0.0	0.2	0.1	1.08	0.0	0.4
Dir/gravel/other 2/	9.2	4.28	8.3	10.2	7.6	4.16	7.3	8.7
Total Inorganics	19.6				21.9			
Total	100				100			

1 / Includes ferrous and nonferrous

2 / Includes some organics

3 / 95% confidence interval for the mean = mean \pm 1.96 X SD/SQRT(N)

newspaper concentration in the fall of 1991 was between 4.4 and 5.8 percent. In the winter it was between 6.0 and 8.2 percent. Since there is no overlap in the two intervals, we can say with a fairly high degree of confidence (over 95 percent) the newspaper percentage is actually higher in the winter. Similarly, the percent of newspaper is higher in the summer than the fall. Because the 95 percent interval for the spring overlaps with the other seasons, we can not say (with a 95 percent certainty) that springtime newspaper generation is statistically different from the other seasons.

Figure 2 shows graphically the data from Table 1. The paper fraction appears to be significantly higher in the winter, and, not too surprisingly, the yard waste is higher in the spring and fall. Figure 3 breaks the paper fraction out further, showing it is the "other paper" category that has increased the most. Cardboard is essentially unchanged. Other paper consists of a mixture of all paper that is not newspaper or cardboard.

Figures 4 through 11 are shown to illustrate how scattered the data are. The newspaper and yard waste fraction of each of the 269 samples are shown. Even though there is a huge variation from sample to sample, the statistical analysis shows that enough samples were analyzed that some general conclusions can be reached concerning the average composition of the residential waste stream.

National Average Residential Waste Composition

The national average composition of municipal solid waste (MSW) is shown in the first column of Table 3 with the same components used in the Atlanta sort. Total generation in 1990 is estimated at 196 million tons per year, which is equivalent to about 4.3 pounds per person per day. In order to compare the national data with data developed by the sorting program, data from the first column were adjusted. The second and third columns subtract materials coming from bulky items. The fourth column estimates the percentage of each component of MSW that is from residential sources. Nationally about 60 percent of MSW is estimated to be generated from residences (including multi-family housing).

The next adjustment to the national data is to subtract the quantities of materials recycled. Only materials from the pilot curbside program are included. This represents the minimum recycled from residences. Total recycling estimates were not available in time for this report, but it is likely that significant additional quantities of materials, particularly newspapers and aluminum cans are being recovered in Atlanta.

The last column in Table 3 shows the estimated discards, based on national averages. The quantity, 560 tons per day, is significantly less than estimates based on landfill data.

Figure 2. Atlanta Waste Composition as Disposed
(Residential Sampling 1991-92)

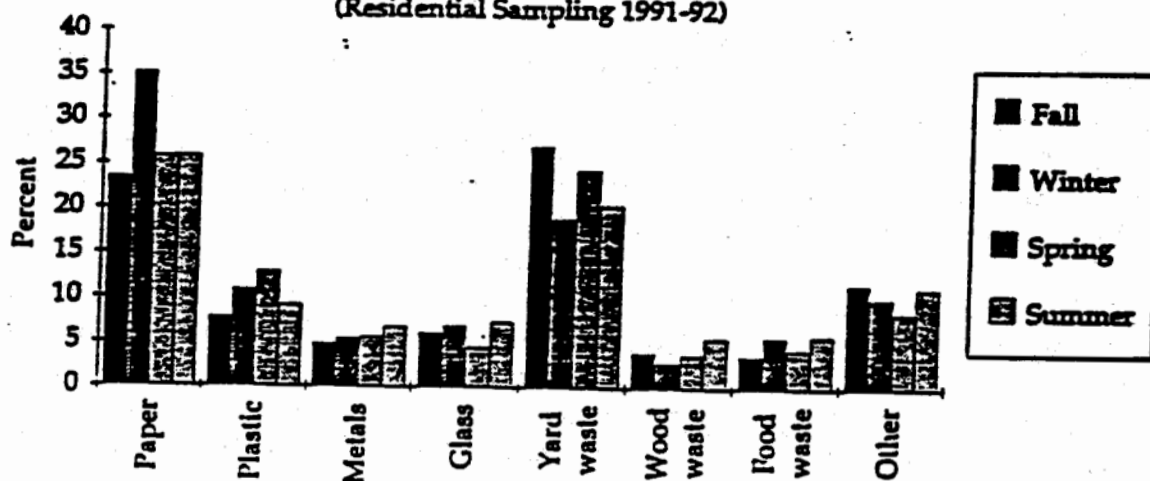


Figure 3. Atlanta Wastepaper Composition as Disposed
(Residential Sampling 1991-92)

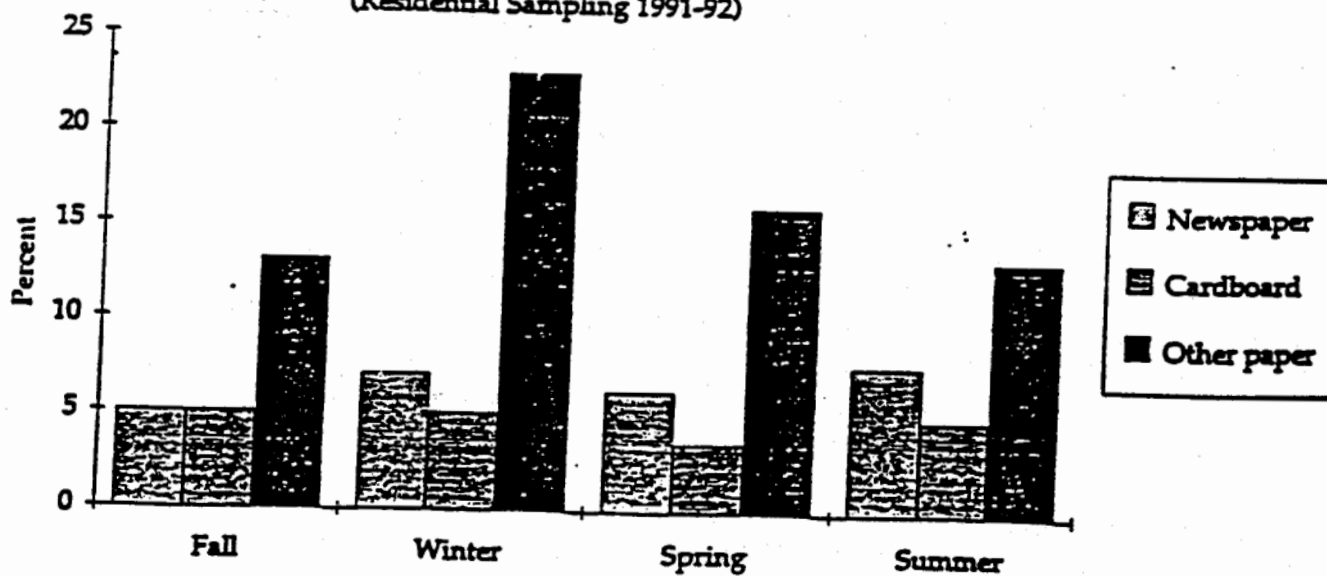


Figure 4. Newspapers Fall Sampling

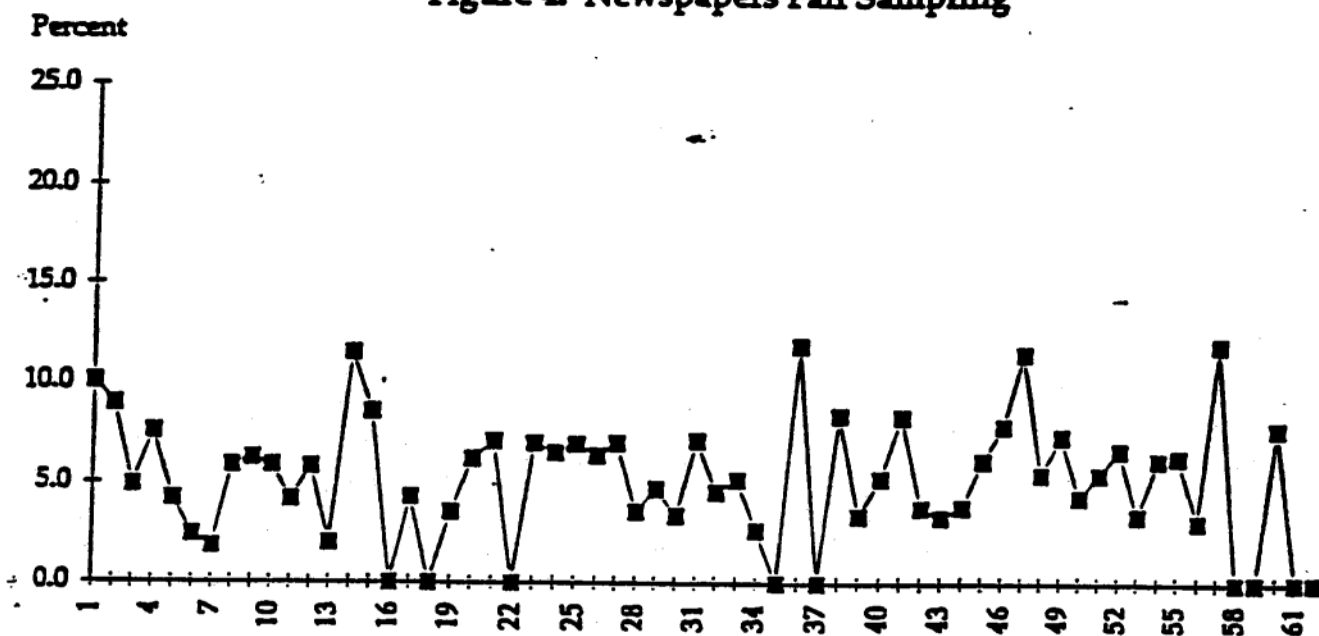


Figure 5. Newspapers Winter Sampling

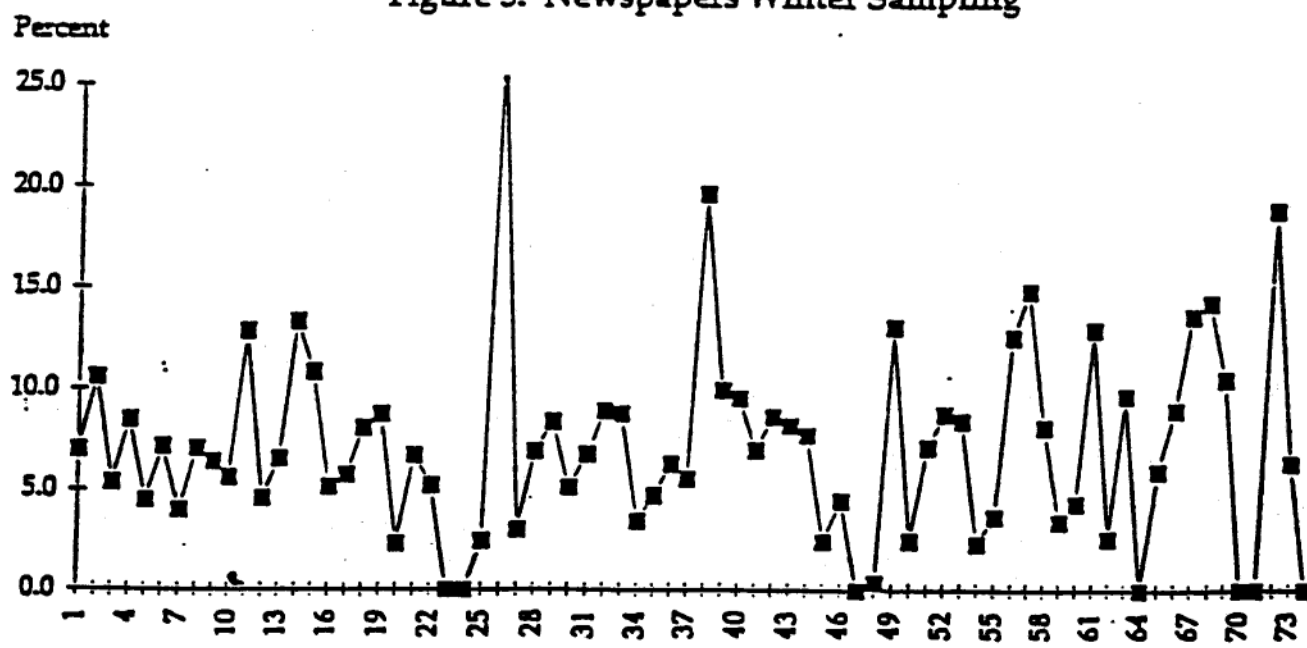


Figure 6. Newspapers Spring Sampling

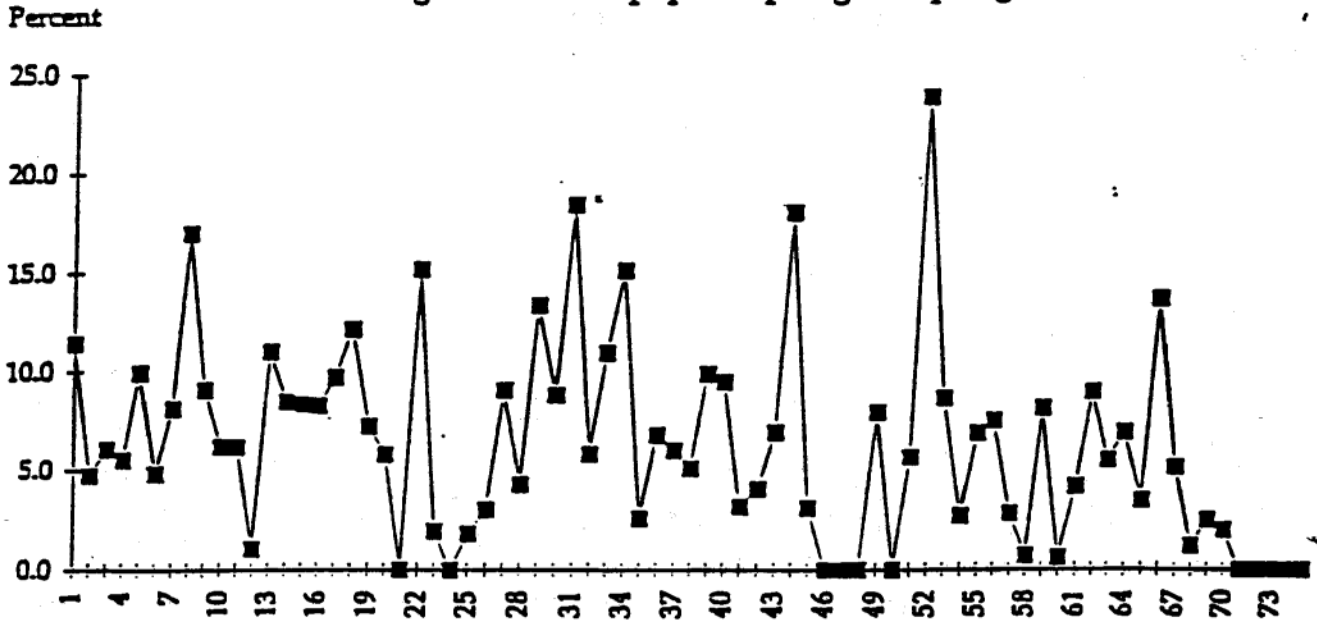


Figure 7. Newspapers Summer Sampling

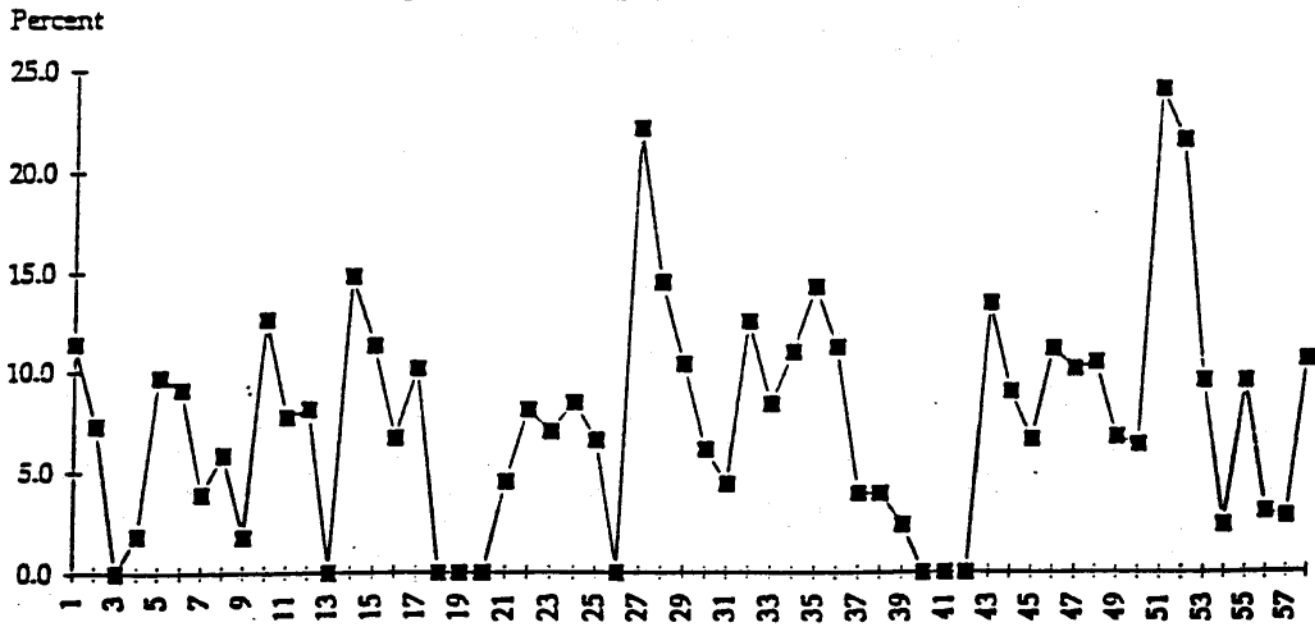


Figure 8. Yard Waste Fall Sampling

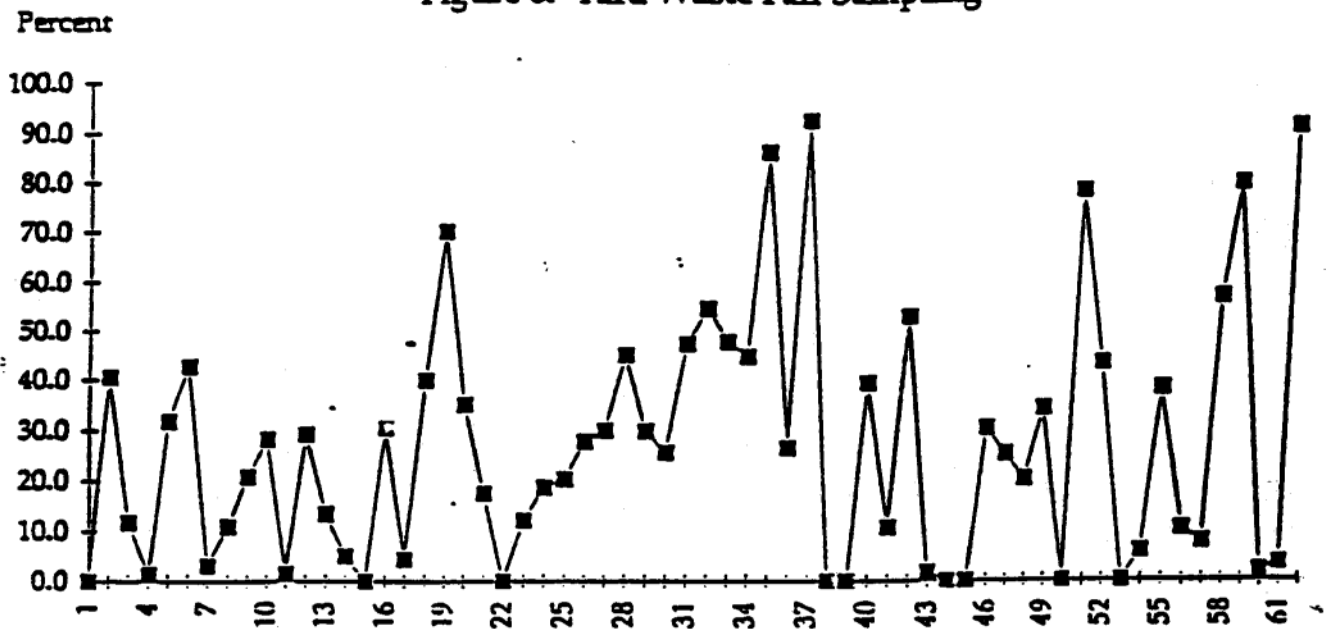


Figure 9. Yard Waste Winter Sampling

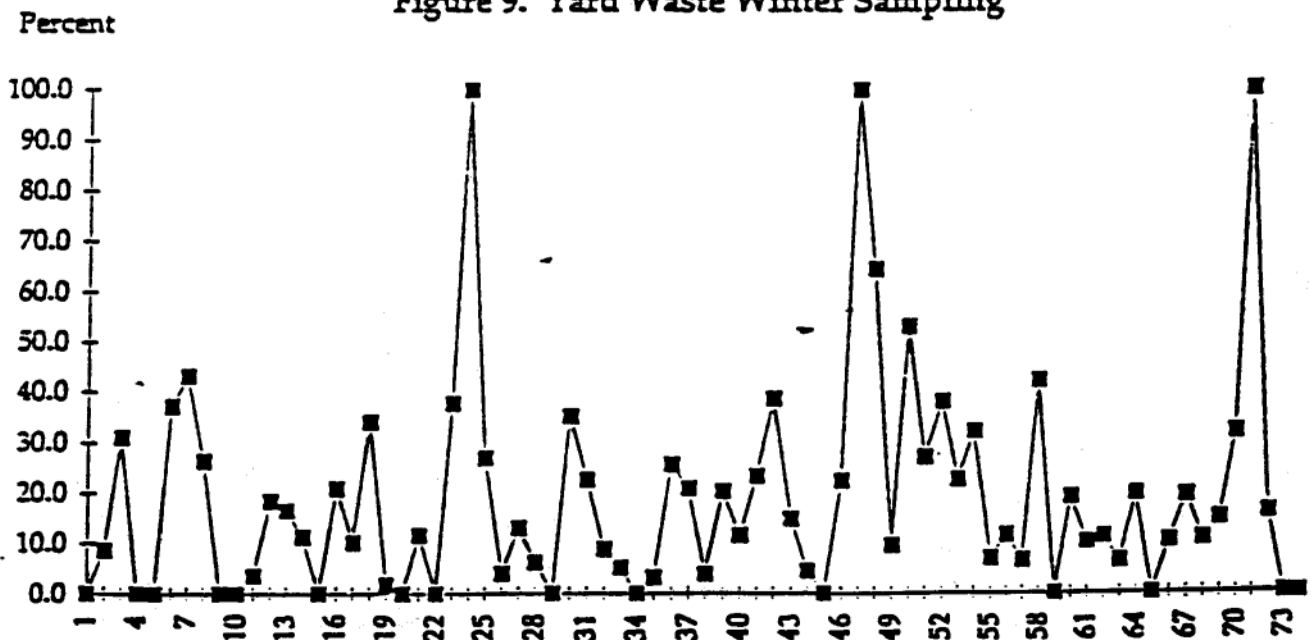


Figure 10. Yard Waste Spring Sampling

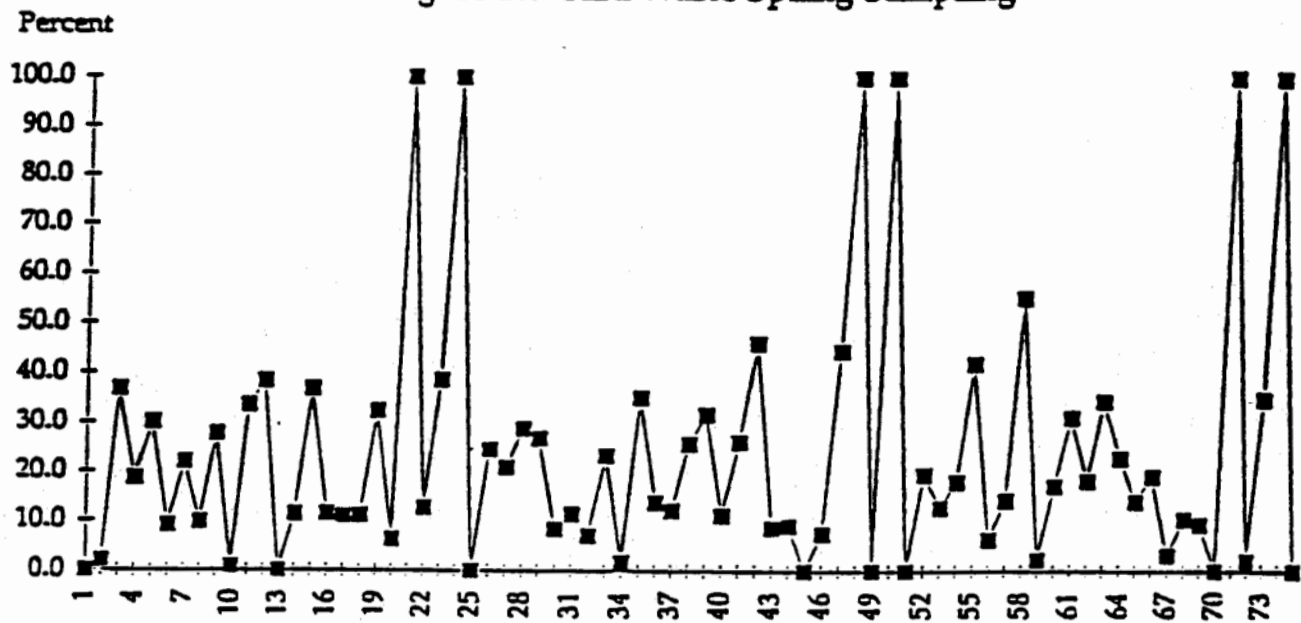


Figure 11. Yard Waste Summer Sampling

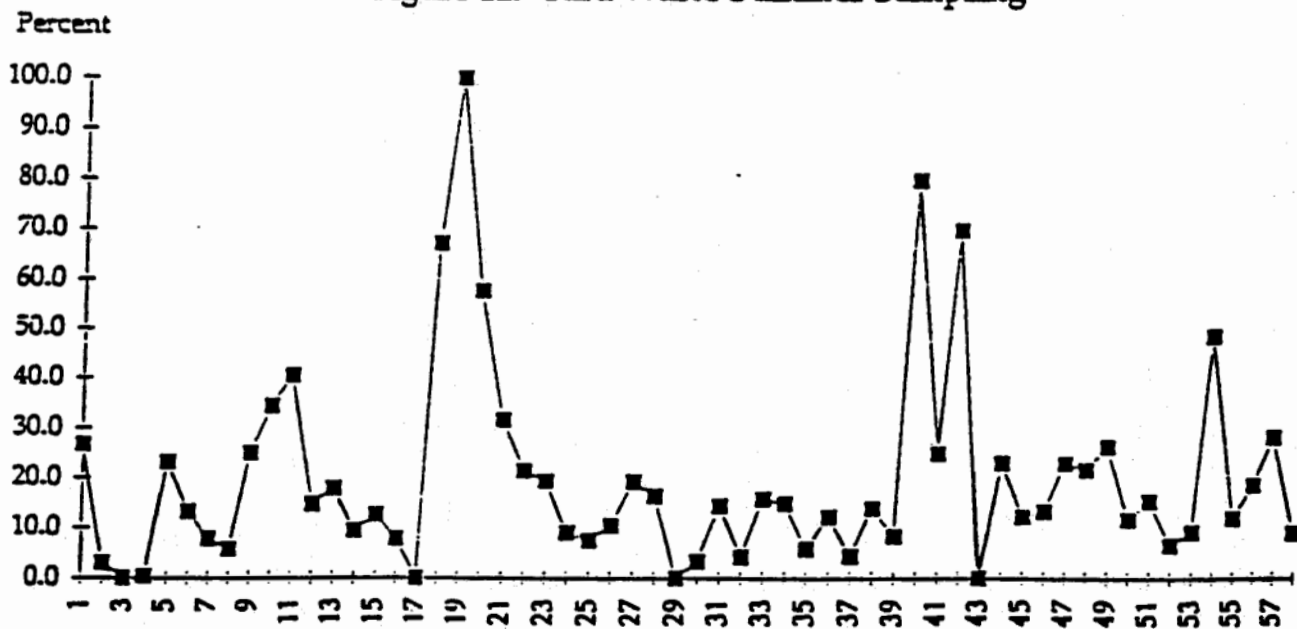


Table 3
CALCULATION OF ATLANTA RESIDENTIAL WASTE COMPOSITION
(based on national averages)

	Estimated 1990 U.S MSW Generation 1/ (Thou TPY)	Subtract material not sampled in ATL 2/ (Thou TPY)	Net Estimated U.S MSW Gen (Thou TPY)	Estimated Percent Residential	Net Residential Generation (Thou TPY) 1990	Calculated Atlanta Resid 3/ (TPY)	Atlanta Residential Recycling (TPY) 4/	Estimated Atlanta Discards (TPY) 5/
Newspaper	12,938		12,938	92	11,903	20,827	382	20,465
Cardboard	23,035		23,035	15	3,590	6,282		6,282
Other paper	36,398	5	36,391	59	21,331	37,324		37,324
Total paper	73,269	5	73,264		36,824	64,432	382	64,071
HDPE	384		384	90	328	573	8	586
PET	435		435	90	392	685	8	677
Polystyrene foam	238		238	55	131	229		229
Other plastic	14,904	759	14,145	75	10,608	18,562		18,562
Total plastic	15,940	759	15,181		11,458	20,049	18	20,033
Yard Waste	35,000		35,000	90	31,500	55,117		55,117
Wood Waste	12,313	3,775	8,538	30	2,561	4,482		4,482
Food Waste	13,200		13,200	60	7,920	13,858		13,858
Diapers	2,649		2,649	90	2,384	4,172		4,172
Tex/Rub/Leather	10,224	3,954	6,270	75	4,703	8,228		8,228
Total Organics	182,595	8,493	154,102		97,350	170,337	377	169,960
Aluminum	2,660	230	2,430	80	1,944	3,401	30	3,371
Tin	2,543		2,543	80	2,034	3,560	37	3,523
Bi-metal	148		148	80	117	204		204
Other Metals	10,822	4,532	6,290	60	3,774	6,603		6,603
Glass bottles	11,905		11,905	80	9,524	18,664	158	18,506
Other glass	1,277	260	1,009	50	505	883		883
Dirt/gravel/other 6/	3,784	884	2,900	65	1,885	3,298		3,298
Total Inorganics	33,137	5,914	27,223		19,783	34,614	225	34,389
Total	185,732	14,407	181,325	59.8	117,133	204,951	602	204,349
Tons/day								566
Pounds per person per day								2.56

1 / Franklin Associates preliminary data, based on work done for USEPA update.

2 / Bulky materials; appliances, furniture, carpets, tires, batteries.

3 / Based on Atlanta population of 437,300

U. S. population (1990)= 249,924,000

4 / Includes only known recovery (materials recovered in Atlanta's pilot curbside program).

It is likely that at least newspapers and aluminum are recycled at much higher rates.

5 / Uncorrected for moisture transfer in compaction and transportation.

6 / Contains some organics.

The final adjustment to the national data is for moisture transfer in the collection and hauling process. Moisture shifts can change the relative weights of waste components appreciably, depending on the wetness of some of the components as generated. In general, during compaction and transportation, the dry organic components, such as paper, pick up moisture from the wet components, such as food and yard wastes. Since moisture testing was not done on the sorted waste, only best estimates based on experience in other areas can be made.

The data in Table 4 shows how the shift in moisture changes the apparent composition from as-generated to as-disposed, where it was sampled. Starting with the as-generated composition, and using typical as-generated and as-discarded moisture levels for each component, the as-discarded composition was calculated. This analysis makes the assumption that the total moisture content of the waste is unchanged from generation to disposal, with some moisture simply being transferred from one material to another. The total paper fraction, as estimated as-disposed, is 35 percent, whereas the as-generated paper estimate is only 31 percent, a shift of about 4 percent.

Also shown in Table 4 are the four season compositions as determined by the sorting project. The last column shows the annual average composition of Atlanta's residential waste disposed. The average for each component was calculated by weighting each season's percent by the relative amount of waste generated in that season. Monthly landfill records (shown in another section) from January 1990 through June 1992 were used to determine the weighting factors as follows: fall 0.94, winter 0.93, spring 1.07, and summer 1.04.

Scanning down the materials, the following observations are made:

- Newspaper: The national average is higher than observed in Atlanta; however, it is believed that 40 percent or more of generation is actually being recovered in Atlanta. The national average newsprint recovery is estimated at 42.5 percent. Assuming 40 percent recovery reduces the estimate based on national data to 6.5 percent, in good agreement with the sorting results.
- Corrugated: Good agreement in the four sorts. Higher than predicted by national averages.
- Other paper: The national average is higher than the annual average sampling percentage. There is good

Table 4
COMPARISON OF ATLANTA RESIDENTIAL SOLID WASTE COMPOSITION AS SAMPLED WITH NATIONAL AVERAGE

	Estimated Atlanta Discards (TPY) 2/	Moisture as Generated (percent)	Average Moisture as Disposed 3/ (percent)	Net Atlanta Discards Moisture Adjusted (TPY)	Residential Composition based on Net data (percent)	Atlanta Residential Sampling Results 7/				Atlanta Weighted Average 8/ 91-92 (percent)
						Fall, 1991 (percent)	Winter, 1992 (percent)	Spring, 1992 (percent)	Summer, 1992 (percent)	
Newspaper	20,485	8.0 (3)	12	21,861	10.7	5.1	7.1	6.3	7.6	6.6
Cardboard	8,282	5.2 (3)	13	8,845	3.3	5.1	5.1	3.8	4.9	4.7
Other paper	37,324	4.1 (3)	18	43,650	21.4	13.2	23.0	16.2	13.6	16.6
Total paper	64,071			72,356	35.4	23.5	35.2	26.3	26.1	27.8
LDPE	566	0	0.57	566	0.3	0.49	0.82	2.3	1.0	1.2
PET	677	0	0.43	680	0.3	0.42	0.84	1	0.6	0.8
Polystyrene foam	229	0	3.49	237	0.1	0.77	0.98	1.2	1.8	1.2
Other plastic	18,562	0	0.73	18,698	9.2	6.15	8.26	8.2	5.6	7.1
Total plastic	20,033			20,184	9.6	7.8	10.9	12.7	9.2	10.3
Yard Waste	55,117	58.8 (4)	52.8	47,859	23.4	27.1	19.0	24.1	19.9	22.6
Wood Waste	4,482	15 (5)	10	4,233	2.1	4.0	2.9	4.4	5.7	4.3
Food Waste	13,858	78.3 (5)	75	12,029	5.9	3.7	5.8	4.3	6.0	5.0
Diapers	4,172	66 (5)	66	4,172	2.0	3.0	3.7	2.2	2.0	2.7
Tex/Rub/Leather	8,228	7 (5)	7	8,228	4.0	6.7	6.4	8.8	9.2	7.7
Total Organics	169,980			169,060	82.7	77.8	63.8	60.8	78.1	80.3
Aluminum	3,371	0	0.17	3,377	1.7	0.83	1.01	1.1	1.5	1.1
Tin	3,523	0	0.49	3,540	1.7	1.83	2.27	2.6	2.0	2.2
Bimetal	204	0	0.49	205	0.1	0.21	1.13	0.6	0.5	0.6
Other Metals	6,603	0	0.49	6,636	3.2	2.04	1.05	1.6	2.9	1.9
Glass bottles	16,506	0	1.22	16,710	8.2	5.48	6.62	4.4	7.3	5.9
Other glass	883	0	1.22	894	0.4	0.63	0.36	0.1	0.1	0.3
Dirt/gravel/other 1/	3,298	0	16.0	3,926	1.9	11.21	3.72	9.2	7.6	8.0
Total Inorganics	34,389			35,289	17.3	22.2	16.2	19.6	21.9	20.0
Total	204,349			204,349	100	100	100	100	100	100

1 / Contains some organics.

2 / National estimates (as generated), corrected for bulky items not sampled, and for Atlanta pilot curbside recovery.

3 / ASME, "Thermodynamic Data for Biomass Materials and Waste Components", 1987.

4 / Value adjusted to balance total moisture.

5 / Parson's Report, "Engineering and Economic Analysis of Waste to Energy Systems", July 1977.

6 / Estimates based on laboratory analysis of sampled data in MN, 1991.

7 / From Atlanta sampling analysis-Table 1.

8 / Weighted averages using landfill records for 1990-1992.

Details may not add to totals due to rounding.

Source: Franklin Associates, Ltd.

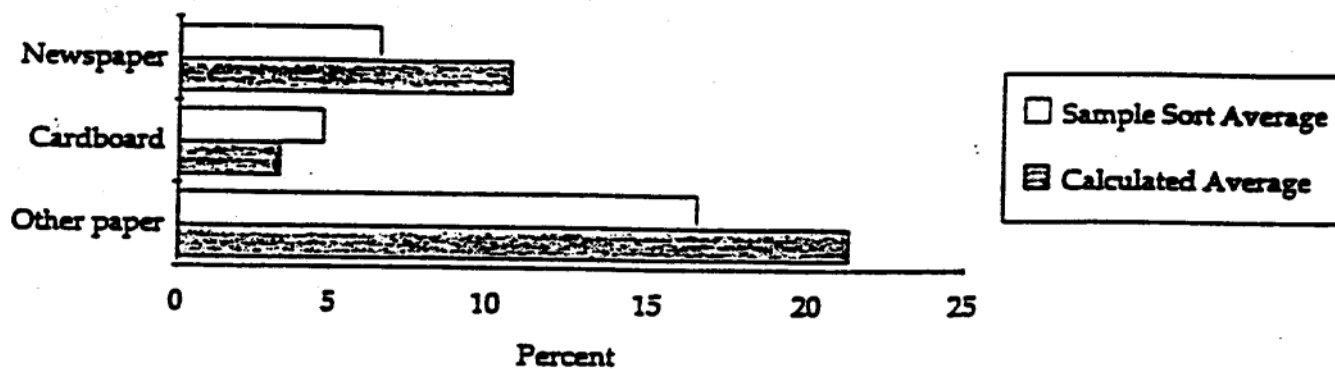
agreement if, as indicated above, newspaper recovery in Atlanta is underestimated.

- **Plastics:** The total national average agrees well with Atlanta's sampling percentage; however, incredibly high quantities of HDPE, PET, and polystyrene foam are observed in Atlanta. The polystyrene foam observed value seems particularly high. Small fractions of the waste stream are particularly subject to random sampling errors; for example, one 520 pound sample in the summer of 1992 contained 95 pounds of polystyrene foam (18 percent!) See Attachment 1.
- **The observed other organics** seem to be in reasonable agreement with national average. Yard waste, food waste, and diapers show good agreement. Wood waste and the category textiles/rubber/leather are almost a factor of two higher in Atlanta.
- **Aluminum:** the sampling numbers appear somewhat low; it is believed that this is because 50 percent or more of aluminum cans are already being recovered. Reliable estimates of current recovery are not available.
- **Tin, bimetal, and other metals:** The total of these metals agrees fairly well with the national average. The bimetal can appears to be significantly higher than national average and the other metals fraction is lower.
- **Glass bottles:** The glass bottles fraction is about 25 percent below the national average.
- **Dirt, gravel other:** This category is high in Atlanta, very likely because of the sampling technique used to sort the fines.

Summary of Residential Composition

Figures 12 and 13 compare the four season sorted average of the primary recyclable materials to the calculated average from Table 4. It should be pointed out that these data represent percentages of the total waste stream and not amounts (tons) of recyclables available. Table 5 summarizes the annual amounts (tons) of recyclables in Atlanta's residential waste stream compared to estimates determined from national averages. The total weights were determined from landfill records. The total waste discarded in Atlanta is about 40 percent higher than the amount predicted from national averages, on a per capita basis.

**FIGURE 12. RESIDENTIAL RECYCLABLES
SAMPLING AVERAGE VERSUS CALCULATED AVERAGE**



**FIGURE 13. RESIDENTIAL RECYCLABLES
SAMPLING AVERAGE VERSUS CALCULATED AVERAGE**

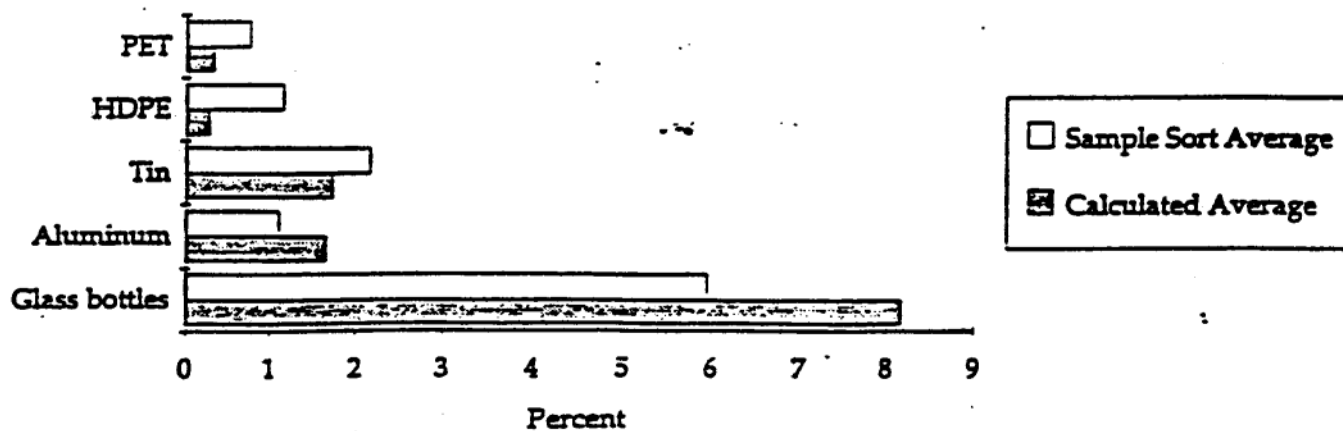


Table 5
ATLANTA RESIDENTIAL WASTE DISCARDS
Compared to Data from National Average

	National Average Net Discards 1/ 1990		1992 Landfill Weight and Sorting Results 2/	
	(TPY)	(percent)	(TPY)	(percent)
Newspaper	21,861	10.7	18,918	6.6
Cardboard	6,845	5.6	13,592	4.7
Other paper	43,651	16.4	47,443	16.5
Total paper	72,357	32.7	79,952	27.8
HDPE	569	0.3	3,431	1.2
PET	680	0.3	2,236	0.8
Polystyrene foam	237	0.1	3,475	1.2
Other plastic	18,698	9.2	20,382	7.1
Total plastic	20,184	9.9	29,524	10.2
Yard Waste	47,858	24.1	65,011	22.6
Wood Waste	4,233	4.1	12,375	4.3
Food Waste	12,029	5.9	14,331	5.0
Diapers	4,172	2.0	7,708	2.7
Tex/Rub/Leather	8,228	4.0	22,325	7.7
Total Organics	169,060	83	121,750	80.3
Aluminum	3,377	1.7	3,233	1.1
Tin	3,540	1.7	6,312	2.2
Bimetal	205	0.1	1,753	0.6
Other Metals	6,636	3.2	5,524	1.9
Glass bottles	16,710	8.2	17,133	5.9
Other glass	894	0.4	826	0.3
Dirt/gravel/other 1/	3,926	1.9	23,016	8.0
Total Inorganics	35,289	17.3	57,798	20.1
Total	204,349	100	288,104	100
Tons/day 3/	560		789	
Pounds per person per day	2.56		3.61	

1/ From Table 4. Assumes Atlanta's recycling rates.

2/ Tonnage from City landfill weight records. Percents from Table 4.

3/ Based on 365 days per year.

4/ Population assumed is 437,300

It is the consultant's opinion that the annual tonnages of recyclables, as measured from the sampling analysis are reasonable, except for the three plastic components, HDPE, PET, and polystyrene foam, and bimetal cans. These four components, as measured, are unbelievably high, probably as a result of sampling error. A review of the actual sampling weights (attachment 1) shows very erratic behavior for these components, with many samples containing more of these items. For purposes of planning for the recovery of recyclables, it is recommended quantities not over 50 percent higher than the national averages be used, unless further sampling is done that confirms the extremely high values.

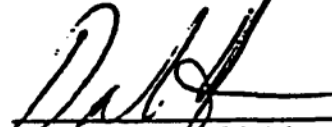
REFERENCES

1. Atlanta Regional Commission, Regional Solid Waste Management Plan, 1992.
2. Franklin Associates, Ltd. "Characterization of Municipal Solid Waste in the United States 1992 Update". Final Report, July, 1992. U.S. EPA Office of Solid Waste.
3. Atlanta Regional Outlook, May, 1991.
4. U.S. Bureau of the Census. County Business Patterns, 1988.
5. Michigan Department of Natural Resources, Resource Recovery Section. "Solid Waste Stream Assessment Guidebook". June, 1986.

APPENDIX B

CERTIFICATION STATEMENT

I certify that the existing capacity and projected life for Live Oak Landfill and Recycling Center is sufficient to include the City of Atlanta's estimated annual tonnage for the next ten years, as expressed in the Request For Proposal for the disposal of municipal solid waste for the City of Atlanta, Department of Public Works (FC-5626-92).



Dale Courtney, Division President
Live Oak Landfill & Recycling Center

APPENDIX C

AN ORDINANCE

BY CITY UTILITIES COMMITTEE

AN ORDINANCE TO AMEND THE CITY OF ATLANTA CODE OF ORDINANCES SECTION 9-6068 SO AS TO ADD NEW REPORTING AND PERMITTING REQUIREMENTS FOR SOLID WASTE COLLECTION; TO REPEAL CONFLICTING ORDINANCES OR PARTS THEREOF; AND FOR OTHER PURPOSES.

WHEREAS, the Solid Waste Management Act requires that each local government prepare a long range solid waste management plan (SWMP); and

WHEREAS, the City of Atlanta is required to assure solid waste disposal capacity for 10 years, as a component of the SWMP; and

WHEREAS, the City of Atlanta is required to monitor both the residential and commercial waste streams within its jurisdiction; and

WHEREAS, there is a need for a mechanism to monitor commercial waste collection.

NOW THEREFORE, BE IT HEREBY ORDAINED BY THE COUNCIL OF THE CITY OF ATLANTA AS FOLLOWS:

SECTION 1: That Part 9, Chapter 6, Article D, Section 9-6068 is hereby amended by deleting the current §9-6068 and inserting in lieu thereof the following new §9-6068 to read as follows:

(a) No person shall engage in the collection, transfer or transportation of solid waste without having applied for permission therefor and received the approval of the commissioner, in the form of a written permit. Every person obtaining permission shall conform to the provisions of this section and the rules of the department. Upon violation of the provisions of this section or the rules of the department, the permit shall be revoked by the commissioner.

(b) No person engaged in the collection, transfer or transportation of solid waste shall be licensed to do business in the City of Atlanta, under the provisions of Part 14, Chapter 5, Article A of the Code of Ordinances unless it is demonstrated that a permit has been obtained in accordance with subsection (a) of this section.

(c) As a condition of permit issuance, every person licensed to engage in the collection, transfer or transportation of solid waste shall demonstrate and assure that sufficient disposal capacity for their projected collections through the year 2004 have been identified.

(d) Following the initial permit issuance, every person licensed to engage in the collection, transfer or transportation of solid waste shall, by January 31 of each calendar year, provide a written report to the Department providing the following information: (1) the weight of solid waste collected for disposal within the jurisdiction of the City of Atlanta in the previous calendar year and the location of disposal; (2)

the projected waste collection for the next calendar year; (3) the location and availability of their disposal for the next calendar year; and (4) evidence that disposal has been secured for the next calendar year.

SECTION 2: That all ordinances or parts of ordinances in conflict herewith are hereby repealed.

O-94-025

APPENDIX D

FC-5424-92

**CONTRACT DOCUMENTS
FOR
CITY WIDE CURBSIDE RECYCLING PROGRAM**

**MAYNARD JACKSON, MAYOR
CITY OF ATLANTA, GEORGIA**

**DOUGLAS HOOKER, ACTING COMMISSIONER
DEPARTMENT OF PUBLIC WORKS**

**W. CEDRIC MADDOX, DIRECTOR
BUREAU OF SANITARY SERVICES**

STATE OF GEORGIA

COUNTY OF FULTON

**AGREEMENT FOR
CITY WIDE CURBSIDE RECYCLING PROGRAM**

This Agreement made and entered into this 22ND day of July, 1993, by and between the CITY OF ATLANTA, a municipal corporation of said State and County, hereinafter referred to as the "CITY" and BFI of Atlanta/Dreamsan, a joint venture hereinafter referred to as the "CONTRACTOR".

WITNESSETH

WHEREAS, the City did seek proposals for the development and implementation of a city wide curbside recycling program; and

WHEREAS, the Contractor possesses the knowledge, skill and workforce necessary to provide the services desired by the City; and

WHEREAS, by resolution adopted by the Council of the City of Atlanta on June 7, 1993 and approved by the Mayor on June 7, 1993, this Agreement with the Contractor was authorized, a copy of said Resolution being attached hereto, marked Exhibit "A", and made a part hereof by reference.

NOW, THEREFORE, for and in consideration of the mutual agreements between the parties hereinafter contained, and for other good and valuable consideration, the parties hereto do agree as follows:

BASIC SERVICES

The Contractor agrees to provide the necessary personnel and equipment to implement a city wide curbside recycling program at approximately 87,000 single family residences within the City limits of Atlanta, Georgia. Said program will consist of the collection and removal of recyclable material including aluminum and tin cans; clear, brown and green glass bottles and jars; plastic milk jugs and soda bottles; and newspapers, which are placed in or adjacent to recycling bins at the curbside or public street. Additions or deletions to the above recyclable materials may be made at any time during the contract period if mutually agreed upon by both parties.

Collection of recyclables shall take place on the same day as the City's garbage collection and in accordance with the routes and schedules provided to the Contractor by the City upon execution of this Agreement. Holiday and inclement weather schedules shall also be in accordance with that of the City. All vehicles used in the collection of recyclables shall be provided by the Contractor in accordance with the proposal document , Section III, Collection Vehicles, marked "Exhibit B", attached hereto and made a part hereof by reference. Maintenance and operation of said vehicles shall be the sole responsibility of the Contractor. Each vehicle shall be identified with signage, approved by the City, representative of the City of Atlanta's Recycling Program.

The Contractor agrees to maintain a local Hot Line number which will be attended from 8:00 a.m. to 5:00 p.m. Monday through Friday. This number will be prominently displayed on all trucks, recycling bins and literature associated with this Agreement.

CONTAINERS

Contractor shall supply a single collection container to each household which will keep material dry and will contain the maximum amount of post-consumer recycled plastic available without damaging the integrity of the container.

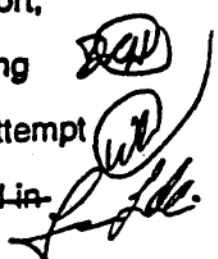
Container shall be a black 18 gallon covered cart with wheels, or such other container as shall be mutually agreed upon by the City and the Contractor, and shall carry a five (5) year guarantee covering workmanship and materials. Each cart shall be marked by serial number matched to the household address to which it is delivered. A list of serial numbers and matching addresses shall be maintained by the Contractor and supplied to the City for record keeping purposes.

Mechanical maintenance of the collection containers shall be the sole responsibility of the Contractor, and each container shall be properly maintained and kept in working order. The Contractor shall also be responsible for the replacement of containers and container lids, damaged or missing, up to 5% on an annual basis. The Contractor shall be reimbursed at cost by the City for replacement of containers over the 5% annual amount.

Each container used in the collection of recyclables shall be marked with the City's approved logo and shall become the property of the City.

MARKETING

Contractor shall provide, or cause to be provided, services to receive, sort, process, and market the collected materials to reputable remanufacturing sources at fair market prices. The Contractor agrees that a good faith attempt will be made to market all materials in the recycling program locally, and in

Handwritten signature and initials in the bottom right corner of the page.

~~accordance with Exhibit B, that section entitled "Marketing of Recyclable Materials", attached hereto and made a part hereof by reference)~~

WA
JTE
DSD

The City and the Contractor agree that gross revenues from the sale of any and all recyclables will be divided equally between the City and the Contractor and the Contractor shall remit such revenues to the City quarterly.

RECORDS

Contractor agrees to provide monthly activity reports to the City throughout the life of this Agreement. Each monthly report shall detail the daily weights of the materials collected by category and route and the number of households participating every day by route. Each monthly report shall also include Public Information/Education activities. Each activity shall be itemized and explicitly identified for the previous month. The monthly report shall also include the number of missing or damaged carts subject to replacement. The monthly report shall be due in the Bureau of Sanitary Services no later than the 10th of each month. The Contractor also agrees to provide a weekly report to the City, via fax or telephone, identifying any verified missed collection stops and the reasons for them. This information shall also be included on the monthly activity report. All information contained in any status report provided by the Contractor is subject to verification by the City.

In addition, the Contractor agrees to submit quarterly status reports and affidavits verifying the weight and the price of the materials sold, by category, and the entities to whom it was sold. After the 1st month of operation the Contractor shall also provide information on the number and type of hot-line

calls received during the quarter. Quarterly reports shall be due within fifteen working days of the close of the quarter being reported .

Annual reports shall be provided by the Contractor and submitted to the City no later than 30 calendar days from the end of the reporting year. Additionally, a year-end report shall be provided which shall include both the time period involved from the commencement of this agreement until the end of the current calendar year and the time period included in the contract agreement for the pilot program, FC-5318-92. Both the year-end and annual reports shall include the following: a summary of the City of Atlanta's program costs and revenues; summary of material markets; summary of the set out characteristics and components of the program; and recommended changes for revisions. All reports shall be submitted in a format mutually agreed upon by the City and the Contractor. Agreement of the format shall be made at least 30 days before a report is due.

PUBLIC INFORMATION AND EDUCATION

Contractor shall provide a public information program targeting both the participants of the program and the public at large. Said program shall include, but not be limited to, a City-approved announcement letter to each participant household, an instructional brochure, an announcement prior to the delivery of the container, an instructional sticker to be applied to each container, and an improper set-out notice. All literature distributed to the public must be approved by the City prior to distribution. In addition, any public contact programs relating to this Agreement , i.e., seminars, speaking engagements, press conferences, etc., shall be approved by the City prior to scheduling and/or commencement.

Other public information activities may be requested by the City to be performed by the Contractor if mutually agreed upon by both parties.

PERSONNEL

The Contractor shall provide the necessary personnel sufficient to meet the recycling program outlined in this Agreement. All personnel shall be those of the Contractor or subcontractor. The Contractor shall provide the same benefits for each employee associated with this Agreement as those benefits provided for similarly situated employees of the Contractor.

SPECIAL SERVICES

The Contractor shall be responsible for the verification of households included in the recycling program and supplying such information to the City.

The Contractor shall also schedule and attend monthly meetings with the City's representatives to discuss the progress and problems of the recycling program.

COMPENSATION

The City agrees to compensate the Contractor in accordance with the terms and conditions of this Agreement as follows:

For services described herein, the City shall pay the Contractor \$2.13 per household per month and a total not to exceed amount of the \$2,223,720.00 per year. Payment to the Contractor shall be on a monthly basis and shall be based on invoices received and approved by the City.

Invoices shall be submitted to the Bureau of Sanitary Services, Department of Public Works and approval of same shall not be unreasonably withheld by the City. The City shall remit payment to the Contractor within fifteen (15) days of approval by the Department of Public Works.

A monthly activity report must be submitted and received by the City before a monthly payment is made to the Contractor.

CONTRACT DURATION

The length of this agreement shall be one (1) year from the date of notice to proceed. This agreement may be renewed by mutual consent for two (2) additional years in one (1) year periods provided the City Council appropriates the funds and the Department of Finance verifies fund(s) availability per City Code, Section 5-5060. In addition, another one (1)

Such waste includes, but is not limited to, wastes resulting from the following manufacturing processes: Electric power generation; fertilizer/agricultural chemicals; food and related products/by-products; inorganic chemicals; iron and steel manufacturing; leather and leather products, nonferrous metals manufacturing/foundries; organic chemicals; plastics and resins manufacturing; pulp and paper industry; rubber and miscellaneous plastic products; stone, glass, clay, and concrete products; textile manufacturing; transportation equipment; and water treatment. This term does not include mining waste or oil and gas waste.

(28) "Inert Waste Landfill" means a disposal facility accepting only wastes that will not or are not likely to cause production of leachate of environmental concern. Such wastes are limited to earth and earth-like products, concrete, cured asphalt, rock, bricks, yard trimmings, stumps, limbs, and leaves. This definition excludes industrial and demolition waste not specifically listed above.

(29) "Lateral expansion" means a horizontal expansion of the waste boundaries of an existing MSWLF unit or landfill unit.

(30) "Leachate" means a liquid that has passed through or emerged from solid waste and contains soluble, suspended, or miscible materials removed from such wastes.

(31) "Landfill Unit" means an area of land on which or an excavation in which solid waste is placed for permanent disposal and which is not a land application unit, surface impoundment, injection well, or compost pile. Permanent disposal requires the placement of daily, intermediate, and/or final earth, synthetic, or a combination of earth and synthetic cover over the solid waste.

(32) "Leachate Collection System" means a system at a landfill for collection of the leachate which may percolate through the waste and into the soils surrounding the landfill.

(33) "Liner" means a continuous layer of natural or man-made materials, beneath or on the sides of a disposal site or disposal site cell which restricts the downward or lateral escape of solid waste, solid waste constituents, or leachate.

(34) "Liquid Waste" means any waste material that is determined to contain "free liquids" as defined by Method 9095 (Paint Filter Liquids Test), as described in "Test Methods for the Evaluation of Solid Wastes, Physical/Chemical Methods" (EPA Pub. No. SW-846).

(35) "Materials Recovery Facility" means a solid waste handling facility that provides for the extraction from solid waste of recoverable materials, materials suitable for use as a fuel or soil amendment, or any combination of such materials.

year option to renew may be exercised by mutual agreement between the two parties and is subject to renegotiation.

CITY'S RESPONSIBILITY

The City shall provide to the Contractor, to the extent possible, any information in its possession to allow the Contractor to accomplish the work outlined in this Agreement.

If, during the life of this Agreement, the number of handicapped or elderly households are increased by more than 25% over the amount identified by the City upon commencement of the work outlined herein, the City and the Contractor may renegotiate an allowance for the increased amount.

The City shall designate a representative authorized to act in its behalf with respect to this project. The City's designee shall promptly render any decision necessary for the orderly progress of the work and the contractor shall be permitted to rely upon such a decision in the performance of its obligation.

The City shall furnish to the Contractor information or materials in its possession (i.e., collection routes, schedules, addresses, etc.) which relate to this project promptly upon execution of this Agreement.

ACCOUNTING RECORDS

All records of expenses pertaining to this agreement shall be kept on a sound accounting basis and shall be available to the City or its authorized representative at mutually convenient times.

In addition, the City, shall have authority to audit project records at the City's cost, the Contractor's records and its sub contractor's records at any time for a period of at least three (3) years after close-out-of the contract.

TERMINATION / NON- RENEWAL OF AGREEMENT

This Agreement may be terminated by either party upon forty five (45) days written notice should the other party fail to perform in accordance with its terms through no fault of the party initiating the termination. The City agrees to provide the Contractor with notice of any problems that exist and allow the Contractor 15 days to provide a remedy or to provide a plan for a remedy that is acceptable to the City.

In the event of termination of the Contractor by the City, the Contractor shall be paid compensation for services performed to termination date. Such payments shall apply only in the event of a termination and shall not apply to non-renewal of this Agreement.

If the Contractor is adjudged bankrupt, or if it makes a general assignment for the benefit of its creditors or if a receiver is appointed on account of its

insolvency, or if it persistently disregards laws, ordinances, rules, regulations or orders of any public authority having jurisdiction, or fails to comply with any term or orders of any public authority having jurisdiction, or fails to comply with any term or condition of this Agreement, then the City may, without prejudice to any right or remedy and after giving notice as required by this Section, terminate this Agreement, and finish this Project by whatever method it deems expedient, including but not limited to replacing the Contractor by another Contractor. The Contractor shall be entitled to compensation for services performed prior to such termination

If the work is stopped for a period of thirty (30) days under an order of any court or other public authority having jurisdiction, or as a result of an act of government, such as declaration of a national emergency making materials unavailable, or prohibitive increases in the cost of fuel or the lack of availability of fuel, through no act or fault of the City, or if the work is stopped for the City's failure to make payments as provided in this Agreement, then the Contractor may, thirty days after written notice to the City, terminate the Agreement, and recover from the City payment for actual cost incurred to termination. Further, in the event of failure by the City to renew the contract at the end of the first year or at the end of the second year, the contractor will receive from the City, the buyout costs of the recycling bins and the trucks purchased specifically for work to be performed under the terms of this agreement. Buyout shall be in accordance with the table listed in "Exhibit D", attached hereto and made a part hereof by reference. If the City does not elect to renew this Agreement at either the end of the first year or the end of the second year, and the City pays buyout costs in accordance with "Exhibit D", the trucks shall become the property of the City. In addition, the City and the Contractor agree that in the event the

Agreement is renewed for two (2) one (1) year terms, at the end of the third year the City shall have the option to negotiate for the purchase the trucks referenced herein in accordance with the buyout costs listed in Exhibit D.

OWNERSHIP OF MATERIALS

Any materials developed specifically for the City's program and utilized as a part of this Agreement, i.e., brochures, hand-outs, newsletters, etc., shall become the property of the City except those portions of said material which is owned and copyrighted by the Contractor. Route information, schedules, addresses, etc., made available to the Contractor as a part of this Agreement shall also remain the property of the City and shall not be transferred to any other entity without the approval of the City. Such information shall be kept confidential by the Contractor.

COMMENCEMENT OF WORK

The work called for under this Agreement shall commence upon receipt by the Contractor of a letter of notice to proceed from the Commissioner of the Department of Public Works.

SUCCESSORS AND ASSIGNS

The Contractor shall not assign, sublet or transfer any interest in this Agreement without the written consent of the City except to BFI or Dreamsan.

STATEMENT OF NONDISCRIMINATION

During the performance of this contract, the Contractor agrees that: "We, the supplier of goods, materials, equipment or services covered by this bid or contract will not discriminate in any way in connection with the contract in the

employment of persons, or refuse to continue the employment of any person, on account of the race, creed, color or national origin of such person".

During the performance of this contract, the Contractor further agrees as follows:

- (a) The Contractor shall not discriminate against any employee, or applicant for employment, because of race, religion, color, sex or national origin. As used herein the words "shall not discriminate" shall mean and include without limitation the following:

Recruited, whether by advertising or other means; compensated, whether in the form of rates of pay or other forms of compensation; selected for training, including apprenticeship; promoted; upgraded, demoted; downgraded; transferred; laid off; and terminated.

- (b) The Contractor agrees to and shall post in conspicuous places, available to employees and applications for employment, notices to be provided by the contracting officers setting forth the provisions of the nondiscrimination clause.
- (c) The Contractor shall in all solicitation or advertisement for employees, placed by or on behalf of the Contractor state that all qualified applicants will receive consideration for employment without regard to race, religion, color, sex or national origin.
- (d) The Contractor shall furnish all information and reports required by the Contract Compliance Officer pursuant to this Ordinance and shall permit

access to the books, records and accounts during the normal business hours of the Contractor by the contracting agency and the Contract Compliance Officer for the purpose of investigation so as to ascertain compliance with the program.

- (e) The Contractor shall take such action with respect to any subcontract relating to this Agreement as the Owner may direct as a means of enforcing the provisions of paragraphs (a) through (h) herein, including penalties and sanctions for non-compliance; provided, however, that in the event the Contractor becomes involved in or is threatened with litigation as a result of such direction by the City, the City will enter into such litigation as necessary to protect the interest of the City and the Contractor and to effectuate the Equal Employment Opportunity Program of the City and, in the case of contracts receiving Federal assistance, the Contractor or the City may request the United States to enter into such litigation to protect the interests of the United States.
- (f) The Contractor and his subcontractors, if any, shall file compliance reports at reasonable times and intervals with the City in the form and to the extent prescribed by the Contract Compliance Officer of the City of Atlanta. Compliance reports filed at such times as directed shall contain information as to the employment practices, policies, programs and statistics of the Contractor and its subcontractors.
- (g) The Contractor shall include the provisions of paragraphs (a) through (h) of this Equal Employment Opportunity in every subcontract or Purchase

Order so that such provisions will be binding upon each subcontractor or vendors

(h) A finding as hereinafter provided, that a refusal by the Contractor or Subcontractor to comply with any portion of this program, as herein provided and described, may subject the offending party to any or all the following penalties:

- (1) Withholding from the Contractor in all future payments under the involved public contract until it is determined that the Contractor or subcontractor is in compliance with the provisions of the contract;
- (2) Refusal of all future bids for any public contract with the City or any of its departments or divisions until such time as the Contractor or subcontractor demonstrates that there has been established and there shall be carried out all the provisions of the program as provided in this Article;
- (3) Cancellation of the public contract in accordance with the terms outlined herein; and
- (4) In a case in which there is substantial or material violation, or the threat of substantial or material violation of the compliance procedure herein set forth or as may be provided for by the contract, appropriate proceedings may be brought to enforce those provisions, including the enjoining, within applicable law, of contractors, subcontractors, or other organizations, individuals, or

groups who prevent or seek to prevent directly or indirectly compliance with the policy as herein provided.

INSURANCE

The Contractor agrees to procure all of the insurance and bonds and adhere to all terms and conditions relating thereto as specified in

'Exhibit C' attached hereto and made a part hereof by reference

INDEMNIFICATION

In addition to its agreement to obtain and maintain the insurance as set forth herein above, the Contractor agrees to indemnify and hold harmless the City of Atlanta, its officers, agents and employees, from, any and all claims against the City of Atlanta, its officers, agents and employees which arise out of any negligent act of omission of the Contractor or any sub-contractors employed by the Contractor or any of their officers, agents or employees, any and all claims which result from any condition negligently created or maintained by the Contractor or any sub-contractors employed by the Contractor or any of their officers, agents or employees, which condition was not specified to be created or maintained by this Agreement. The Contractor further agrees that its agreement to indemnify and hold harmless the City of Atlanta, its officers, agents and employees shall not be limited to the limits of the insurance required under this Agreement.

STANDARD OF PROFESSIONAL SERVICES

The Contractor by the execution of this Agreement, contracts that he is possessed of that degree of care, learning, skill, and ability which is ordinarily

possessed by other members of his profession and further contracts that in the performance of the duties herein set forth he will exercise such degree of care, learning, skill, and ability as is ordinarily employed by Contractor under similar conditions and like circumstances and shall perform such duties without neglect, and shall not be liable except for failure to exercise such degree of care, learning, skill and ability. In the event of such failure, the city's remedy shall be reperformance of the services in question by the Contractor.

EXTENT OF AGREEMENT

This Agreement represents the entire and integrated agreement between the City and the Contractor and supersedes all prior negotiations, representations or agreements, either written or oral. This Agreement may be amended only by written instrument which is approved by a Resolution adopted by the Council of the City of Atlanta, approved by the Mayor and signed by both parties.

GOVERNING LAW

This Agreement shall be governed by the law of the State of Georgia now in force and as hereafter amended from time to time.

FORCE MAJUERE

Contractor shall not be considered in default in the performance of its obligations under this Agreement to the extent that the performance of its obligations is prevented or delayed by any cause beyond Contractor's reasonable control, including without limitation: an act of God; acts or emissions of governmental authorities, City, contractors or vendors; strikes,

EXHIBIT B

III. Statement of the Project

Scope of Program

BFI of Atlanta/Dreamsan will collect and remove all recyclable material including aluminum and tin cans; clear, brown and green glass bottles and jars; plastic milk jugs and soda bottles; and newspapers, which are placed in or adjacent to recycling bins at the curbside or public streets. These items constitute the basic recycling program that can be expanded to include additional materials. Curbside collection of office paper; corrugated cardboard; magazines; chipboard; styrofoam; and used motor oil can be negotiated with the City. The items will be collected from approximately 87,000 single family residences in the City of Atlanta on a weekly basis. City residents will have the convenience of collection of both garbage and recyclables on the same day.

Collection Vehicles

BFI of Atlanta will purchase and operate new recycling vehicles with compartmentalized bodies for the source separation of the materials. Each recyclable is placed into individually labeled compartments of the recycling vehicle. This method of source separation is the superior method of collection according to end-users.

As seen in the pamphlet *Glass Recycling and the Importance of Quality*, published by Southeast Glass Recycling Program, the glass recycling industry stresses that "color separation of glass is best done by the collector at the time of collection." Curbside separation is superior to commingled recyclables that are separated later, due to the fact that contamination is reduced. When the glass is dumped together, fragments from broken bottles become mixed. The mixed fragments of glass are often unsuitable for recycling and is landfilled. BFI of Atlanta/Dreamsan protects against this undesirable situation from occurring by source separation at the curb.

BFI of Atlanta/Dreamsan will also protect against contaminants such as paper, plastic and wood which can affect color control and the melting process of glass. The best way to ensure a strong recycling market is to provide consistent, quality loads of recyclables to our end-users. The value of curbside separation to the City of Atlanta is this method leads to higher tonnage of waste diverted from the landfill, which is the result of a successful recycling program.

The collection vehicles will be tailored to identify the City of Atlanta when being used for this project. If agreed to by the City, a conspicuous magnet of the City seal will be placed on both sides of the vehicles prior to collection of the recyclables.



APPENDIX E

GLOSSARY OF TERMS

DEFINITIONS FROM
RULES OF
GEORGIA DEPARTMENT OF NATURAL RESOURCES
ENVIRONMENTAL PROTECTION DIVISION
CHAPTER 391-3-4 SOLID WASTE MANAGEMENT

391-3-4-.01 Definitions. Amended.

(1) "Active Life" means the period of operation beginning with the initial receipt of solid waste and ending at completion of closure activities.

(2) "Active Portion" means that part of a solid waste handling facility or landfill unit that has received or is receiving wastes and that has not been closed.

(3) "Aquifer" means a geological formation, group of formations, or portion of a formation capable of yielding significant quantities of ground water to wells or springs.

(4) "Affected County" means, in addition to the county in which a facility is or is proposed to be located, each county contiguous to the host county and each county and municipality within a county that has a written agreement with the facility to dispose of solid waste.

(5) "Asbestos-Containing Waste" means any solid waste containing more than 1 percent, by weight, of naturally occurring hydrated mineral silicates separable into commercially used fibers, specifically the asbestiform varieties of serpentine, chrysotile, cumingtonite-grunerite, amosite, riebeckite, crocidolite, anthophyllite, tremolite, and actinolite, using the method specified in Appendix A, Subpart F, 40 CFR Part 763, Section 1.

(6) "Baling" means a volume reduction technique whereby solid waste is compressed into bales.

(7) "Biomedical Waste" means any solid waste which contains pathological waste, biological waste, cultures, and stocks of infectious agents and associated biologicals, contaminated animal carcasses (body parts, their bedding, and other wastes from such animals), chemotherapy waste, discarded medical equipment and parts, not including expendable supplies and materials, which have not been decontaminated, as further defined in Rule 391-3-4-.15:

(8) "Boiler" means a device as defined in Chapter 391-3-11, the Rules for Hazardous Waste Management.

(9) "Certificate" means a document issued by a college or university of the University System of Georgia or other organization approved by the Director, stating that the operator has met the requirements of the Board for the specified operator classification of the certification program.

(10) "Closure" means a procedure approved by the Division which provides for the cessation of waste receipt at a solid waste disposal site and for the securing of the site in preparation for post-closure.

(11) "Collector" means the person or persons as defined herein who, under agreements, verbal or written, with or without compensation does the work of collecting and/or transporting solid wastes, from industries, offices, retail outlets, businesses, institutions, and/or similar locations, or from residential dwellings, provided however, that this definition shall not include an individual collecting and/or transporting waste from his own single family dwelling unit.

(12) "Commercial solid waste" means all types of solid waste generated by stores, offices, restaurants, warehouses, and other nonmanufacturing activities, excluding residential and industrial wastes.

(13) "Composting" means the controlled biological decomposition of organic matter into a stable, odor free humus.

(14) "Construction/Demolition Waste" means waste building materials and rubble resulting from construction, remodeling, repair, and demolition operations on pavements, houses, commercial buildings and other structures. Such wastes include, but are not limited to asbestos containing waste, wood, bricks, metal, concrete, wall board, paper, cardboard, inert waste landfill material, and other nonputrescible wastes which have a low potential for groundwater contamination.

(15) "Detected" means statistically significant evidence of contamination has been determined to exist by using methods specified in Rule 391-3-4-.14.

(16) "Director" means the Director of the Environmental Protection Division of the Department of Natural Resources.

(17) "Disposal Facility" means any facility or location where the final disposition of solid waste occurs and includes, but is not limited to, landfilling and solid waste thermal treatment technology facilities.

(18) "Division" means the Environmental Protection Division of the Department of Natural Resources.

(19) "Existing MSWLF or landfill unit" means:

(a) any municipal solid waste landfill or landfill unit that is receiving solid waste as of October 9, 1993 and meets either of the following two conditions:

1. disposed of over 100 tons per day (TPD) of solid waste between October 9, 1991 and October 9, 1992 (or other dates consistent with Federal standards and as may be approved by the Director), or;

2. is on the National Priorities List (NPL), as found in appendix B to 40 CFR, Part 300.

(b) any municipal solid waste landfill or landfill unit that is receiving solid waste as of April 9, 1994 and meets the following two conditions:

1. disposed of 100 tons or less per day of solid waste between October 9, 1991 and October 9, 1992, and disposes of no more than an average of 100 TPD of solid waste each month between October 9, 1993 and April 9, 1994 (or other dates consistent with Federal standards and as may be approved by the Director), and;

2. is not on the National Priorities List (NPL), as found in appendix B to 40 CFR, Part 300.

(c) Waste placement in existing units must be consistent with past operating practices or modified practices to ensure good management.

(20) "Generator" means any person in Georgia or in any other state who creates solid waste.

(21) "Garbage" means food waste including waste accumulations of animal or vegetable matter used or intended for use as food, or that attends the preparation, use, cooking, dealing in or storing of meat, fish, fowl, fruit or vegetables.

(22) "Groundwater" means water below the land surface in a zone of saturation.

(23) "Hazardous Waste" means any solid waste which has been defined as a hazardous waste in regulations promulgated by the Board of Natural Resources, Chapter 391-3-11.

(24) "Household waste" means any solid waste (including garbage, trash, and sanitary waste in septic tanks) derived from households (including single and multiple residences, hotels and motels, bunkhouses, ranger stations, crew quarters, campgrounds, picnic grounds, and day-use recreation areas).

(25) "Host Local Government" means the host county or other local host governmental jurisdiction within whose boundaries a municipal solid waste disposal facility is located.

(26) "Industrial Furnace" means a device as defined in Chapter 391-3-11, the Rules for Hazardous Waste Management.

(27) "Industrial Waste" means solid waste generated by manufacturing or industrial processes that is not a hazardous waste regulated under the Hazardous Waste Management Act and regulations promulgated by the Board of Natural Resources, Chapter 391-3-11.

(36) "Monofill" means a method of solid waste disposal that involves the landfilling of one waste type or wastes having very similar characteristics in a segregated trench or area which is physically separated from dissimilar or incompatible waste.

(37) "Municipal Solid Waste" means any solid waste derived from households, including garbage, trash, and sanitary waste in septic tanks and means solid waste from single-family and multifamily residences, hotels and motels, bunkhouses, campgrounds, picnic grounds, and day use recreation areas. The term includes yard trimmings and commercial solid waste, but does not include solid waste from mining, agricultural, or silvicultural operations or industrial processes or operations.

(38) "Municipal Solid Waste Landfill (MSWLF) Unit" means a discrete area of land or an excavation that receives household waste, and that is not a land application unit, surface impoundment, injection well, or waste pile, as those terms are defined under 40 CFR Part 257.2. A MSWLF unit also may receive other types of solid waste, such as commercial solid waste, nonhazardous sludge, small quantity generator waste and industrial solid waste. Such a landfill may be publicly or privately owned. A MSWLF unit may be a new MSWLF unit, an existing MSWLF unit or a lateral expansion.

(39) "Municipal Solid Waste Disposal Facility" means any facility or location where the final deposition of any amount of municipal solid waste occurs, whether or not mixed with or including commercial or industrial solid waste, and includes, but is not limited to, municipal solid waste landfills and solid waste thermal treatment technology facilities.

(40) "Municipal Solid Waste Disposal Facility Operator" means the operator certified in accordance with Rule 391-3-4-.18 and stationed on the site who is in responsible charge of and has direct supervision of the daily field operations of a municipal solid waste disposal facility to ensure that the facility operates in compliance with the permit.

(41) "Municipal Solid Waste Landfill" means a disposal facility where any amount of municipal solid waste, whether or not mixed with or including commercial waste, industrial waste, nonhazardous sludges, or small quantity generator hazardous wastes, is disposed of by means of placing an approved cover thereon.

(42) "New MSWLF Unit" means any municipal solid waste landfill unit that has not received waste prior to October 9, 1993.

(43) "Open Burning" means the combustion of solid waste without:

a. Control of combustion air to maintain adequate temperature for efficient combustion;

b. Containment of the combustion reaction in an enclosed device to provide sufficient residence time and mixing for complete combustion; and

c. Control of the emission of the combustion products.

(44) "Open Dump" means a disposal facility at which solid waste from one or more sources is left to decompose, burn or to otherwise create a threat to human health or the environment.

(45) "Operating Record" means written records including, but not limited to, permit applications, monitoring reports, inspection reports, and other demonstrations of compliance with this Chapter, which records are kept on file at the facility or at an alternative location as approved by the Division.

(46) "Operator" means the person(s) responsible for the overall operation of a facility or part of a facility.

(47) "Owner" means the person(s) who owns a facility or part of a facility.

(48) "Person" means the State of Georgia or any other state or any agency or institution thereof, and any municipality, county, political subdivision, public or private corporation, solid waste authority, special district empowered to engage in solid waste management activities, individual, partnership, association or other entity in Georgia or any other state. This term also includes any officer or governing or managing body of any municipality, political subdivision, solid waste authority, special district empowered to engage in solid waste activities, or public or private corporation in Georgia or any other state. This term also includes employees, departments, and agencies of the federal government.

(49) "Post-closure" means a procedure approved by the Division to provide for long-term financial assurance, monitoring, and maintenance of a solid waste disposal facility to protect human health and the environment.

(50) "Private Industry Solid Waste Disposal Facility" means a disposal facility which is operated exclusively by and for a private solid waste generator for the purpose of accepting solid waste generated exclusively by said private solid waste generator.

(51) "Processing Operation" means any method, system or other treatment designed to change the physical form or chemical content of solid waste and includes all aspects of its management (administration, personnel, land, equipment, buildings and other elements).

(52) "Putrescible Wastes" means wastes that are capable of being quickly decomposed by microorganisms. Examples of putrescible wastes include but are not necessarily limited to kitchen wastes, animal manure, offal, hatchery and poultry processing plant wastes, dead animals, garbage and wastes which are contaminated by such wastes.

(53) "Run-off" means any rainwater, leachate, or other liquid that drains over land from any part of a facility.

(54) "Run-on" means any rainwater, leachate, or other liquid that drains over land onto any part of a facility.

(55) "Recovered Materials" means those materials which have known use, reuse, or recycling potential; can be feasibly used, reused or recycled; and have been diverted or removed from the solid waste stream for sale, use, reuse, or recycling, whether or not requiring subsequent separation and processing.

(56) "Recovered Materials Processing Facility" means a facility engaged solely in the storage, processing, and resale or reuse of recovered materials. Such term shall not include a solid waste handling facility; provided, however, any solid waste generated by such facility shall be subject to all applicable laws and regulations relating to such solid waste.

(57) "Recycling" means any process by which materials which would otherwise become solid waste are collected, separated, or processed and reused or returned to use in the form of raw materials or products.

(58) "Regional Landfill or Regional Solid Waste Disposal Facility" means a facility owned by a county, municipality, or special district empowered to engage in solid waste management activities, or any combination thereof, which serves two or more or any combination of counties, municipalities, or special solid waste districts.

(59) "Relevant Point of Compliance" is a vertical surface located at the hydraulically downgradient limit of the waste management unit boundary that extends down into the uppermost aquifer underlying the facility. This point will be specified by the Director and shall be no more than 150 meters from the waste management unit boundary and shall be located on land owned by the owner of the landfill unit. The downgradient monitoring system must be installed at this point, and monitoring conducted to ensure that the concentration values listed in Table 1 of Rule 391-3-4-.07 will not be exceeded in the uppermost aquifer.

(60) "Saturated Zone" means that part of the earth's crust in which all voids are filled with water.

(61) "Scavenge" means the unpermitted removal of solid waste from a solid waste handling facility.

(62) "Shredding" means the process by which solid waste is cut or torn into small pieces for final disposal or further processing.

(63) "Significant Groundwater Recharge Areas" means any area as designated on Hydrologic Atlas 18 Most Significant Ground-Water Recharge Areas of Georgia, 1989, as published by the Georgia Geologic Survey, Environmental Protection Division, Georgia Department of Natural Resources, unless an applicant for a solid waste handling permit or other interested party can demonstrate to the satisfaction of the Director that an area designated on Hydrologic Atlas 18 is or is not, in fact, a significant groundwater recharge area.

(64) "Sludge" means any solid, semi-solid, or liquid waste generated from a municipal, commercial, or industrial wastewater treatment plant, water supply treatment plant, or air pollution control facility exclusive of the treated effluent from a wastewater treatment plant.

(65) "Solid Waste" means any garbage or refuse; sludge from a wastewater treatment plant, water supply treatment plant, or air pollution control facility; and other discarded material including solid, liquid, semisolid, or contained gaseous material resulting from industrial, commercial, mining, and agricultural operations and from community activities, but does not include recovered materials; solid or dissolved materials in domestic sewage; solid or dissolved materials in irrigation return flows or industrial discharges that are point sources subject to permit under 33 U.S.C. Section 1342; or source, special nuclear, or by-product material as defined by the federal Atomic Energy Act of 1954, as amended (68 Stat. 923).

(66) "Solid Waste Handling" means the storage, collection, transportation, treatment, utilization, processing, or disposal of solid waste, or any combination of such activities.

(67) "Solid Waste Handling Facility" means any facility, the primary purpose of which is the storage, collection, transportation, treatment, utilization, processing, or disposal, or any combination thereof, of solid waste.

(68) "Solid Waste Handling Permit" means written authorization granted to a person by the Director to engage in solid waste handling.

(69) "Solid Waste Management Act" or the "Act", wherever referred to in these Rules, means the Georgia Comprehensive Solid Waste Management Act, O.C.G.A. 12-8-20, et seq.

(70) "Solid Waste Thermal Treatment Technology" means any solid waste handling facility, the purpose of which is to reduce the amount of solid waste to be disposed of through a process of combustion, with or without the process of waste to energy.

(71) "Tire" means a continuous solid or pneumatic rubber covering designed for encircling the wheel of a motor vehicle and which is neither attached to the motor vehicle nor a part of the motor vehicle as original equipment.

(72) "Transfer Station" means a facility used to transfer solid waste from one transportation vehicle to another for transportation to a disposal facility or processing operation.

(73) "Uppermost Aquifer" means the geologic formation nearest the natural ground surface that is an aquifer, as well as lower aquifers that are hydraulically interconnected with this aquifer within the solid waste handling facility's property boundary.

(74) "Vertical Expansion" means the expansion of a landfill beyond the approved maximum final elevations and within the approved waste management boundaries of the existing permit.

(75) "Waste Management Unit Boundary" means a vertical surface located at the hydraulically downgradient limit of the unit. This vertical surface extends down into the uppermost aquifer.

(76) "Waste-to-Energy Facility" means a solid waste handling facility that provides for the extraction and utilization of energy from municipal solid waste through a process of combustion.

(77) "Yard Trimmings" means leaves, brush, grass, clippings, shrub and tree prunings, discarded Christmas trees, nursery and greenhouse vegetative residuals, and vegetative matter resulting from landscaping development and maintenance other than mining, agricultural, and silvacultural operations.

Authority O.C.G.A. Section 12-8-20 et seq., as amended.

391-3-4-.02 Solid Waste Handling Permits. Amended.

(1) **Permits Required:** no person shall engage in solid waste handling or construct or operate a solid waste handling facility, except those individuals exempted from the provisions of the Georgia Comprehensive Solid Waste Management Act, under the provisions of O.C.G.A. 12-8-30.10 or O.C.G.A. 12-8-40 or those individuals who have a permit-by-Rule under Rule 391-3-4-.06, without first obtaining a permit from the Director authorizing such activity.

(2) **Solid Waste Handling Permit:** the Director may issue permits for solid waste handling provided the application is judged